LUFTWAFFE COLOURS

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Dr Alfred Price

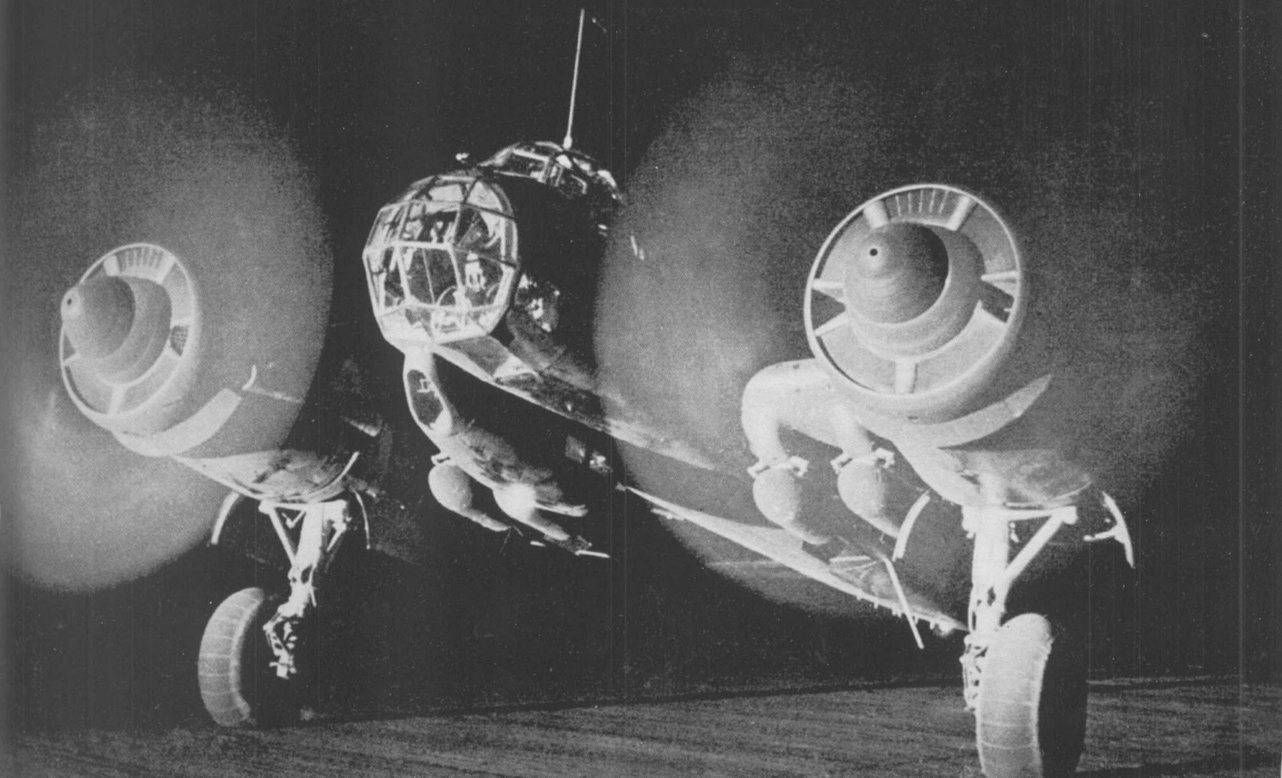
BOMBERS OF THE LUFTWAFFE

January 1942-
September 1943

THE LUFTWAFFE BOMBER FORCE 1933-1945

"The Führer has ordered that the air war against England be given a more aggressive stamp. Accordingly, when targets are being selected, preference is to be given to those where attacks are likely to have the greatest possible effect on civilian life. Besides raids on ports and industry, terror attacks of a retaliatory nature are to be carried out against towns other than London. Minelaying is to be scaled down in favour of these attacks."

Top-secret signal from the Führer's headquarters to the Luftwaffe High Command, 14 April 1942



January 1942-September 1943

Strategic Overview

By the beginning of 1942, the Second World War had become truly global. Now the *Luftwaffe* long-range bomber force began to find itself stretched, though not yet over-stretched. Whereas the previous year it had been able to concentrate its entire effort against a single enemy, Great Britain, its units were now engaged in fighting four disparate types of operation.

In the West the *Luftwaffe* maintained a holding campaign against Great Britain with small-scale attacks, mainly at night, initially on poorly defended targets. Bombers also laid mines in sea lanes leading to the more important ports, as part of the campaign to hinder the nation's maritime trade.

On the Eastern Front the *Luftwaffe* bomber force found itself drawn into a grim war of attrition. Initially the majority of its attacks were made in daylight at high altitude, on targets in direct support of the Army. Also, from time to time, it launched night attacks on strategic targets in the Russian hinterland.

The long-range bomber force suffered its heaviest losses when the Red Army went on to the offensive. Then there were frequent instances where German Army units were in danger of being overrun, and the Army demanded maximum effort attacks from the *Luftwaffe* to provide strikes on battlefield targets. The latter included advancing enemy infantry units, tanks and guns, ammunition transport columns and reserves moving forward. A common characteristic of these targets was their small size and their fleeting nature, which ruled out attacks from high altitude. As well as dive-bombers and specialised ground-attack units, long-range bomber units were also called in to perform these missions. The latter had to go low – below 300 m (1,000 ft) – to find their targets and even lower to hit them. This brought these relatively slow, large and unwieldy machines within range of small calibre automatic weapons, and the Soviet troops used them to good effect. The combination of risky tactics and high sortie rates meant that long-range bomber units suffered serious cumulative losses.

In the Mediterranean Theatre there were frequent daylight battles, as the *Luftwaffe* launched repeated attacks in its bids to subdue the island of Malta, to support Axis ground forces in North Africa and to attack Allied shipping throughout the area.

In the Atlantic *Luftwaffe* anti-shipping units mounted small-scale but effective attacks on merchant shipping, thereby adding to the depredations of the U-boats in the attack on Britain's trade. As yet the *Luftwaffe* lacked an effective force of torpedo bombers, although moves were in train to rectify this deficiency. As a white hope for the future, development work was well advanced on specialised types of air-launched radio-guided anti-shipping missiles.

The crucial 21-month period between January 1942 and September 1943 marked the turning point for the *Luftwaffe* in World War II. During that period, on each battlefront in turn, German armed forces were thrown on to the defensive. At the same time, at each point, the Allied air forces slowly established air superiority over the *Luftwaffe*. In the pages to follow, the reader will observe how the various parts of the long-range bomber force coped with the far-reaching challenges that now faced it.

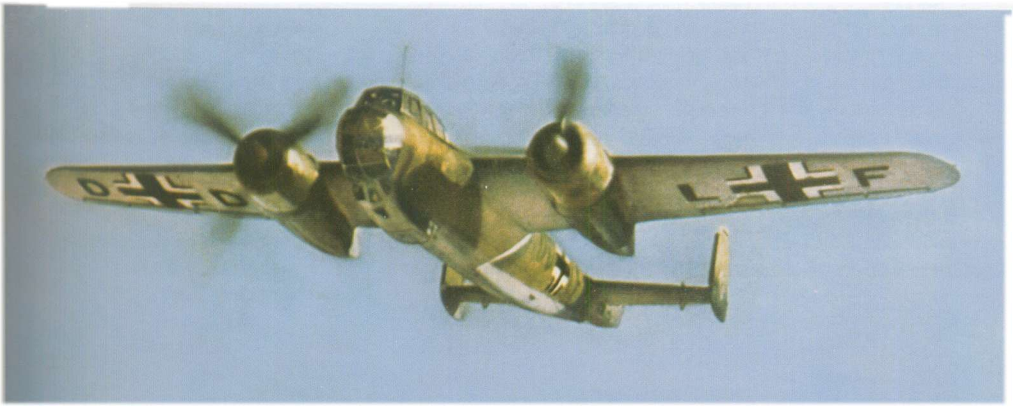
RIGHT: A Ju 88 makes ready for a night attack on the British Isles during the early part of 1942. At this time the Luftwaffe was forced into a holding campaign and with the depletion of the bomber force in the West, due to urgent requirements elsewhere, the attacks were small-scale carried out mainly at night and initially aimed at poorly defended targets.

Bomber Operations against Great Britain

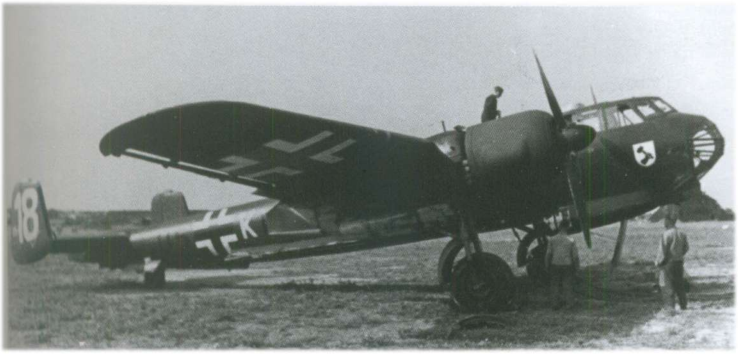
> ***"The Führer has ordered that the air war against England be given a more aggressive stamp. Accordingly, when targets are being selected, preference is to be given to those where attacks are likely to have the greatest possible effect on civilian life. Besides raids on ports and industry, terror attacks of a retaliatory nature are to be carried out against towns other than London. Minelaying is to be scaled down in favour of these attacks."***
>
> *Top-secret signal from the Führer's headquarters to the Luftwaffe High Command, 14 April 1942*

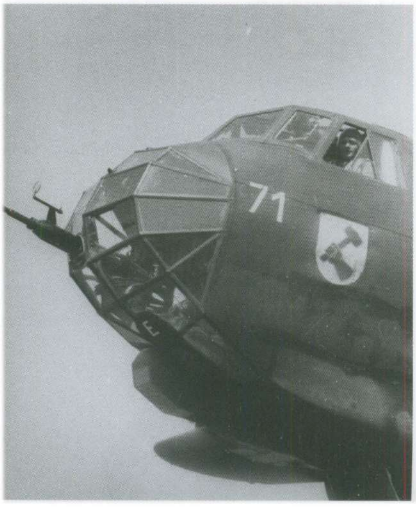
During the early months of 1942 the great majority of the *Luftwaffe* bomber force was committed on the Eastern Front, and there was little activity over Great Britain. That period of uneasy calm came to an end in April when, following a destructive RAF attack on the city of Lübeck, Adolf Hitler ordered the *Luftwaffe* to retaliate.

The first attack in the new series took place on the night of 23/24 April when some 40 aircraft, Do 217s of KG 2, Ju 88s of *Kampfgruppe* 106 and a few He 111s of I./KG 100 raided Exeter. At the time of the raid the sky was overcast, and as a result the bombs fell over a wide area. Only one aircraft hit Exeter, and its stick of four 500 kg (1,100 lb) bombs killed five people, injured eight and caused varying degrees of damage to more than one hundred houses. An RAF Beaufighter shot down one Do 217 near the target.On the night of 25/26 April the *Luftwaffe* returned to Exeter, with an attack in



LEFT: This Do 217 E still carrying the factory call-sign DD+LF, displays an excellent example of a standard factory finish of RLM 70/71 uppersurfaces and 65 pale blue, underneath. The national markings and lettering applied are also to the specified size and location.





ABOVE: This Do 217 E-2, coded U5+KL, belonged to 3./KG 2 and was stationed in France during this time. The machine still carries the 'Holzhammer' emblem of the Geschwader on the nose which was often carried on both sides. The number '18' on the tail assembly was in white as was the fuselage 'K'.

RIGHT: A Do 217 E in this photograph shows the 'Holzhammer' emblem on the port side and also has an MG FF cannon fitted in the nose.

Luftwaffe Bomber Order of Battle 10 January 1942

LUFTFLOTTE 1, 4 and VIII.*Fliegerkorps* (Russian Front)

Stab/KG 1	He 111	*Oberst* Karl Angerstein	Dno	2	(1)
II.*Gruppe*/KG 1	Ju 88	*Major* Herbert Lorch	Dno	27	(20)
III.*Gruppe*/KG 1	Ju 88	*Major* Hans Keppler	Dno	17	(10)
II.*Gruppe*/KG 3	Ju 88	(unknown)	Schatalowka	27	(5)
Stab/KG 4	He 111	*Oberst* Hans-Joachim Rath	Seschtschinskaja	2	(-)
I.*Gruppe*/KG 4	He 111	*Major* Alewyn	Pleskau-Süd	31	(10)
II.*Gruppe*/KG 4	He 111	*Obstlt.* Dr. Gottlieb Wolff	Seschtschinskaja	27	(6)
8. & 9.*Stab*/KG 26	He 111	*Major* Siegfried Böhme (Kdr. III.*Gruppe*)	Seschtschinskaja & Baranowicze	20	(2)
Stab/KG 27	He 111	*Oberst* Hans-Henning Fhr. von Beust	Kirovograd	9	(4)
I.*Gruppe*/KG 27	He 111	(unknown)	Kirovograd	26	(7)
III.*Gruppe*/KG 27	He 111	*Major* Erich Thiel	Kertsch	27	(7)
II.*Gruppe*/KG 30	Ju 88	*Hptm.* Sigmund-Ulrich Fhr. von Gravenreuth	Orscha	33	(10)
Stab/KG 51	Ju 88, He 111	*Oberst* Paul Koester	Nikolayew	2	(1)
II.*Gruppe*/KG 51	Ju 88	*Major* Wilhelm von Friedeburg	Saporoshje	28	(7)
III.*Gruppe*/KG 51	Ju 88	*Major* Ernst Fhr. von Bibra	Nikolayew	29	(10)
Stab/KG 53	He 111	*Oberst* Paul Weitkus	Schatalowka-Ost	4	(3)
II.*Gruppe*/KG 53	He 111	*Obstlt.* Hans Bader	Schatalowka-Ost	16	(1)
III.*Gruppe*/KG 53	He 111	*Major* Richard Fabian	Schatalowka-Ost	26	(19)
15.*(Kroat)Staffel*/KG 53	Do 17	(Croatian unit)	Seschtschinskaja ?		
I.*Gruppe*/KG 55	He 111	*Major* Rudolf Kiel	Kirowograd	28	(7)
Stab/KG 76	Ju 88	*Obstlt.* Dr. Ernst Bormann	Orscha-Süd		
II.*Gruppe*/KG 76	Ju 88	*Hptm.* Volprecht Riedesel Fhr. zu Eisenbach	Orscha-Süd	29	(10)
III.*Gruppe*/KG 76	Ju 88	(unknown)	Orscha-Süd	27	(9)
II.*Gruppe*/KG 77	Ju 88	*Hptm.* Heinrich Paepcke (part only)	Dno	11	(6)
III.*Gruppe*/KG 77	Ju 88	*Major* von Frankenburg (part only)	Dno	12	(11)

LUFTFLOTTE 2 (Mediterranean - 17 January 1942)

Stab/LG 1	Ju 88	*Oberst* Friedrich-Karl Knust	Eleusis		
I.*Gruppe*/LG 1	Ju 88	*Major* Joachim Helbig	Eleusis	27	(12)
II.*Gruppe*/LG 1	Ju 88	*Major* Gerhard Kollewe?	Eleusis	27	(11)
III.*Gruppe*/LG 1	Ju 88	(unknown)	Eleusis	12	(3)
II.*Gruppe*/KG 26	He 111	*Major* W. Beyling	Kalamaki & Saki (Rumania)	30	(10)
7.*Staffel*/KG 26	He 111		Kalamaki	6	(0)
Stab/KG 54	Ju 88	*Obstlt.* Walter Marienfeld	Catania	1	(1)
I.*Gruppe*/KG 54	Ju 88	*Hptm.* Georg Graf von Platen	Gerbini	12	(7)
II.*Gruppe*/KG 77	Ju 88	*Hptm.* Heinrich Paepcke (part only)	Comiso	20	(12)
III.*Gruppe*/KG 77	Ju 88	*Major* von Frankenburg (part only)	Comiso	16	(13)
KGr 606	Ju 88	*Obstlt.* Joachim Hahn	Catania	20	(10)
KGr 806	Ju 88	*Major* Richard Linke	Catania	17	(5)

9.*Fliegerdivision* *Gen.Major* Joachim Coeler Soesterberg

(became IX *Fliegerkorps* on 16 Oct 1940)

Stab/KG 4	He 111 P-4	*Obstlt.* Hans-Joachim Rath	Soesterberg	5	(5)
I. *Gruppe*/KG 4	He 111 P-4	*Hptm.* Meissner	Soesterberg	37	(16)
II. *Gruppe*/KG 4	He 111 P-4	*Major* Dr. Gottlieb Wolff	Eindhoven	37	(30)
III. *Gruppe*/KG 4	Ju 88 A-1	*Hptm.* Erich Bloedorn	Amsterdam/Schiphol	30	(14)
Stab/KG 40	Ju 88 A-1	*Obstlt.* Geisse	Bordeaux-Merignac	2	(1)
KGr 126	He 111 H-4	*Major* Karl-Heinrich Schulz	Nantes	32	(31)

LUFTFLOTTE 3 (France, Belgium and Holland)

Stab/Fl.Füh *Atlantik*	He 111	*General* Ulrich Kessler	Lorient	1	(1)
I.*Gruppe*/KG 40	Fw 200	*Hptm.* Fritz Fliegel?	Bordeaux-Merignac	18	(5)
8. & 9.Stab/KG 40	Ju 88	*Hptm.* Robert Kowalewski (*Kdr.* III.*Gruppe*)	Bordeaux-Merignac	18	(8)

LUFTFLOTTE 5 (Norway, Finland)

I.*Gruppe*/KG 26	He 111	*Obstlt.* Hermann Busch	Baddufoss	27	(20)
Stab/KG 30	Ju 88	*Obstlt.* Erich Bloedorn	Banak	1	(1)
I.*Gruppe*/KG 30	Ju 88	*Hptm.* Jacob Schmidt	Banak with section at Kemi	9	(3)

LUFTWAFFENBEFELSHABER MITTE (Metropolitan Germany)

II.*Gruppe*/KG 2	Do 217	*Major* Robert-Heinrich von Groddeck	Rheine	28	(21)
II.*Gruppe*/KG 40	Do 217	*Hptm.* Wendt Frhr von Schlippenbach	Soesterburg	29	(16)

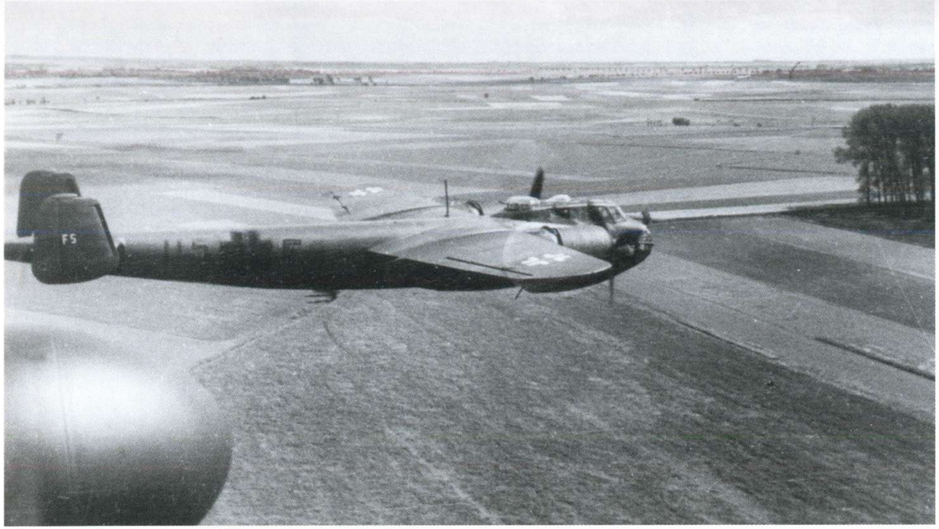
two waves that involved about 25 bombers, many of which flew in both waves. This time the visibility was good and some bombers descended below 1,500 m (5,000 ft) to release their bombs accurately. This double attack caused considerably more damage than the previous raid, with 73 people killed and 54 injured. Night fighters shot down three of the raiders.

During the following night, 26/27 April, the target was Bath and the *Luftwaffe* mustered almost every twin-engined bomber available in the West, even using aircraft and instructors from training units. With almost all aircraft flying double sorties, the attackers put in two concentrated raids each lasting about half an hour. A total of 151 bomber sorties were flown and four bombers failed to return. The following night the raiders returned to Bath and delivered another heavy attack. The two attacks caused severe damage to the city and resulted in the death of some 380 people and injuries to a similar number.

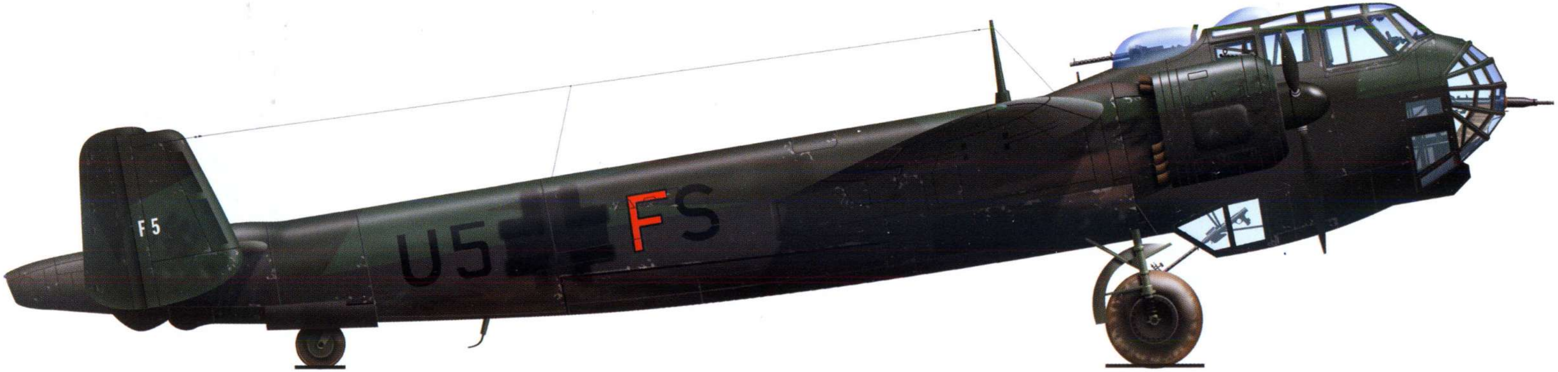
Gradually the pattern of the new series of attacks, known on both sides as the '*Baedeker* raids' (named after the famous German guidebooks), became clear. Launched against the smaller, less well-defended cities, the raids were delivered by concentrated forces on moonlit nights. Most of the raids lasted around half an hour, with frequent double attacks on the same target. The targets were chosen for the weakness of their defences, and as a result the bombers could descend to comparatively low altitudes, often between 1,525 and 3050 m (5,000 and 10,000 ft), to deliver their loads.

During the '*Baedeker*' raids a proportion of the bombers carried a new type of incendiary bomb container, the ABB 500, which held 140 of the 1 kg (2.2 lb) stick incendiary bombs. As the container fell through a previously set altitude, a barometric switch opened it along its length allowing the release of the incendiary bombs. Dropped in this way, the incendiaries arrived on the ground in unprecedentedly high concentrations. During one attack on Bath, for example, 96 incendiaries landed within an area of 25 m sq (30 sq.yds) and 20 went through the roof of a single house. Such

LEFT: A Do 217 E-2 of KG 2 during take-off from its French base in 1942.

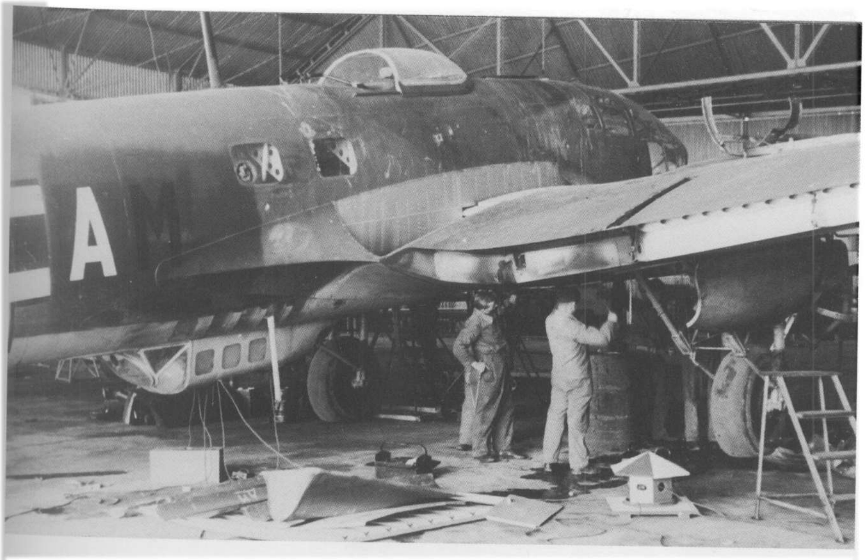


LEFT: A photograph taken in mid-1942 during a mission flying at low level over the French countryside of a Do 217 E-2, U5+FS, of 8./KG 2, seen from another aircraft in the formation. As was common at that time, the undersides and parts of the national markings have been overpainted in black to prevent visibility during nocturnal operations.



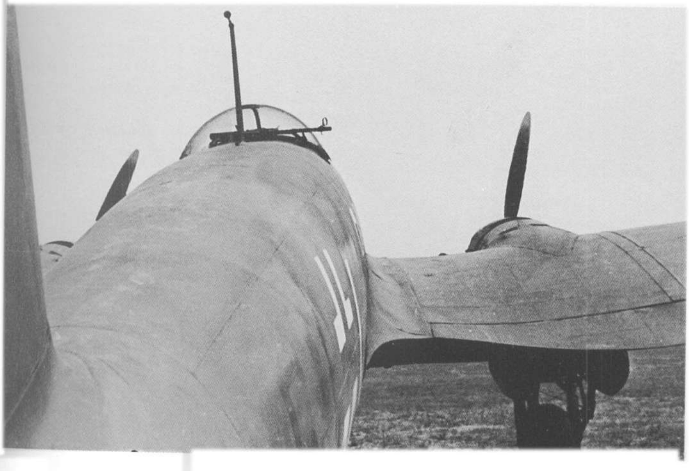
Dornier Do 217 E-2 of 8./KG 2 based at Amsterdam-Schiphol during the early summer of 1942

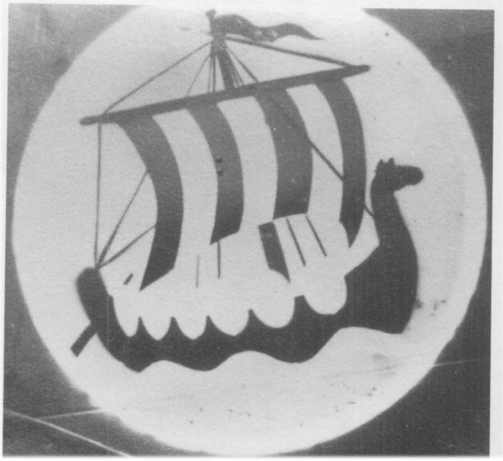
The aircraft's individual letter 'F' is painted red outlined in black while the last two letters of the unit code 'U5+FS' are repeated in white on the outer surfaces of the rudders. Not long afterwards the III. Gruppe of KG 2, then under Major Kurt Leythaeuser, began to receive the improved Do 217 K model.



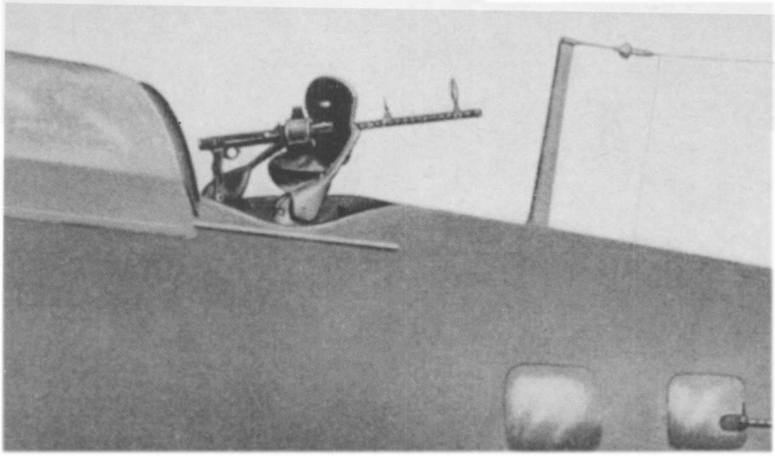
LEFT: This He 111 P of 4./KG 100 is undergoing extensive maintenance work. The aircraft appears to be under new ownership, as the letters 'AM' have been freshly painted on a new RLM 70-coloured area of the fuselage. Where the wing fillet has been removed the exposed metal has been factory painted with zinc chromate, with the external face of the rear spar having been partly overpainted with RLM 02.

BELOW: A close-up view of the KG 100 'Wikingerschiff' Geschwader emblem.

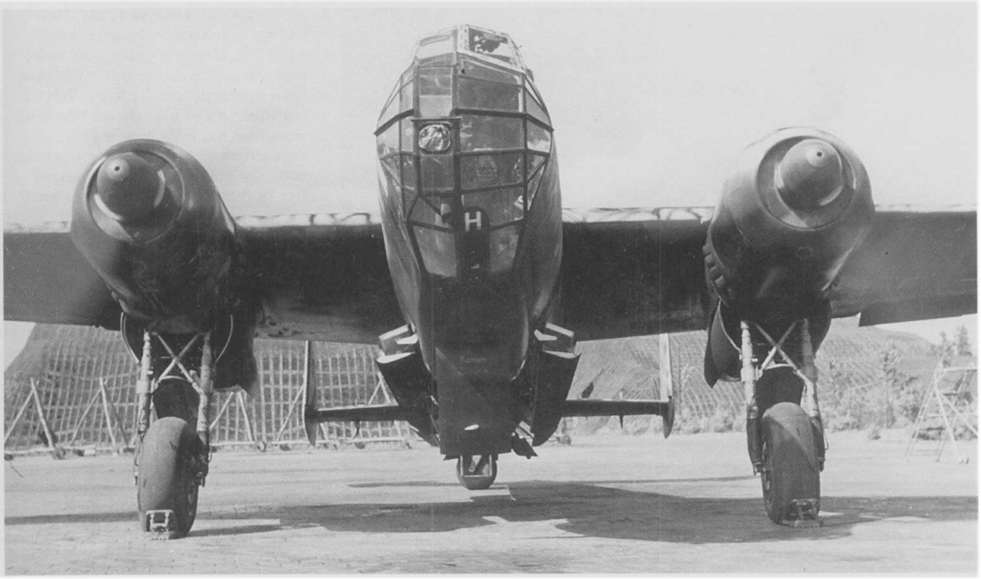




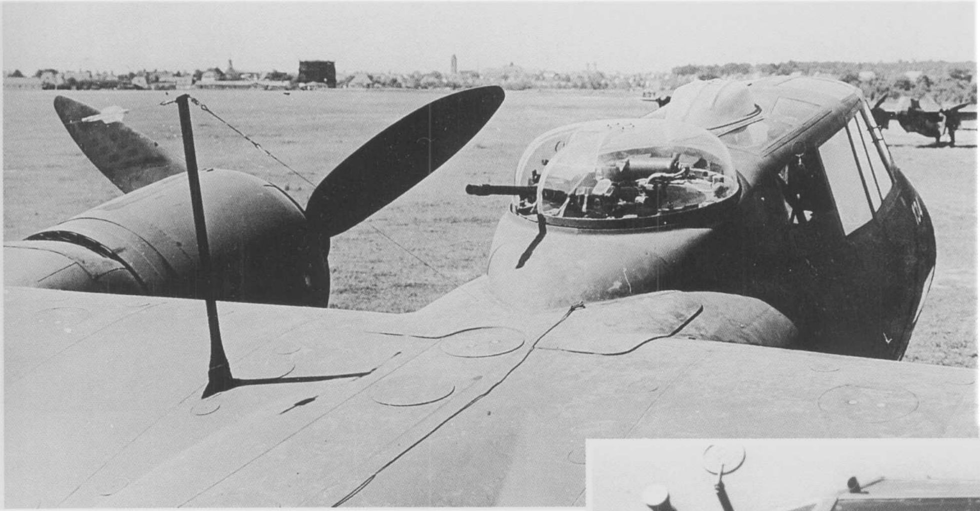
ABOVE: A rear view of a He 111 coded 6N+IH of 1./KG 100 somewhere in France, probably seen in late 1941.



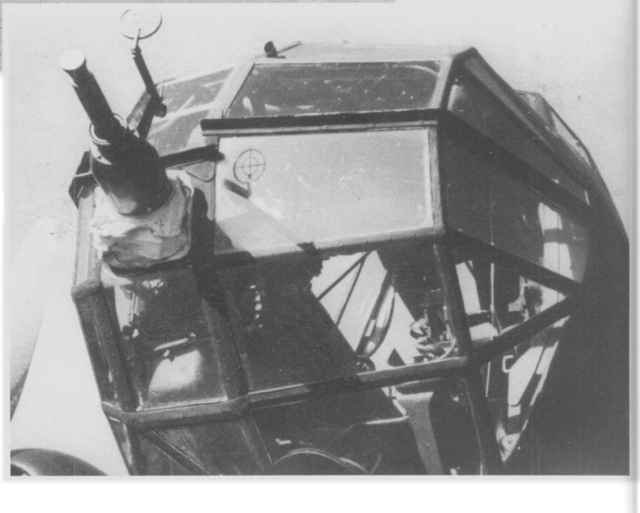
LEFT: A view of the upper rearward-firing MG 15 machine gun position as fitted to a He 111 H-6.



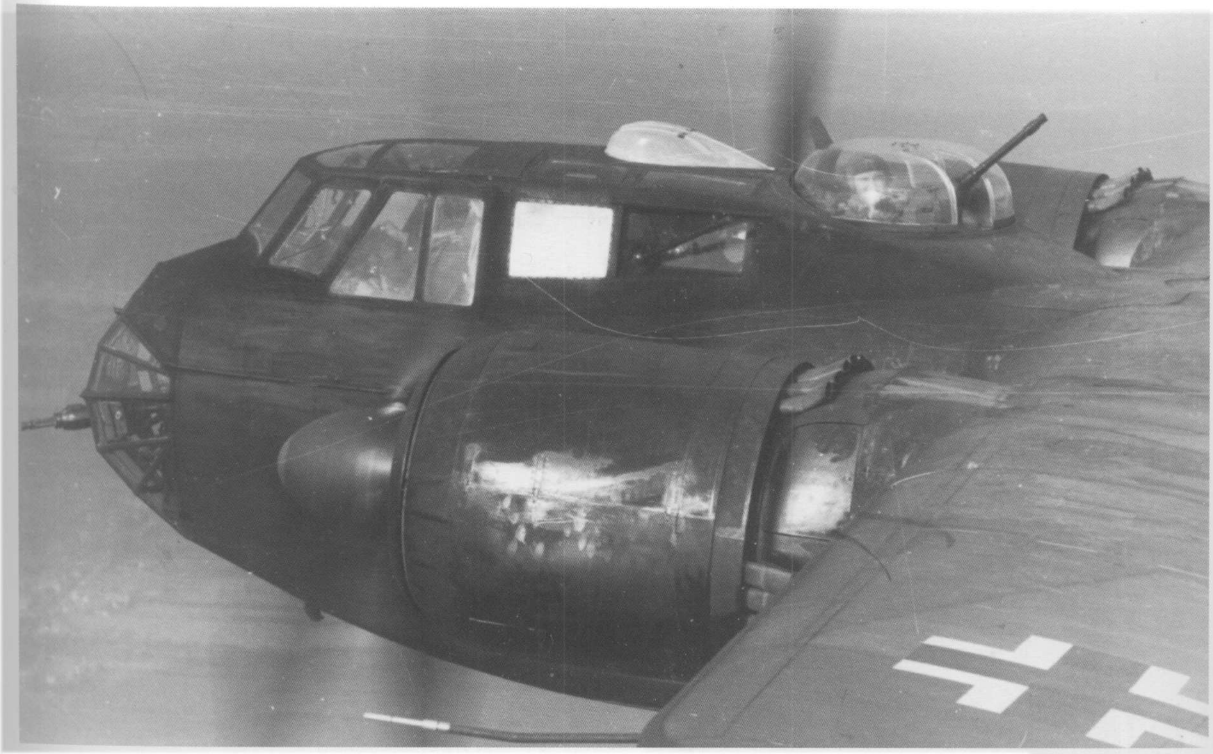
LEFT: A Do 217 E-2 with its bomb doors open, showing the unusual 'double fold' system used on this aircraft.



LEFT: A close-up of the Do 217 E-2, showing the electrically-powered dorsal turret with a single 13 mm MG 131 machine gun.

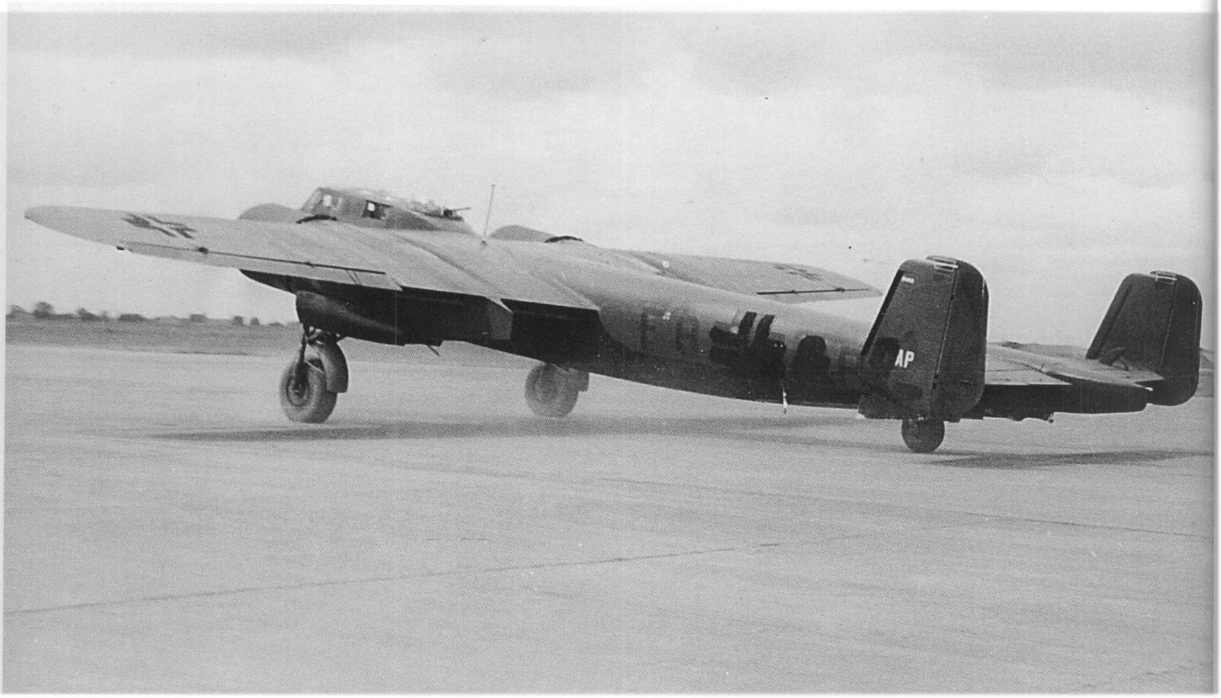


RIGHT: A close-up view of the nose armament of a 20 mm MG FF cannon as fitted to the Do 217 E-5. The weapon was installed to achieve greater operational effectiveness.

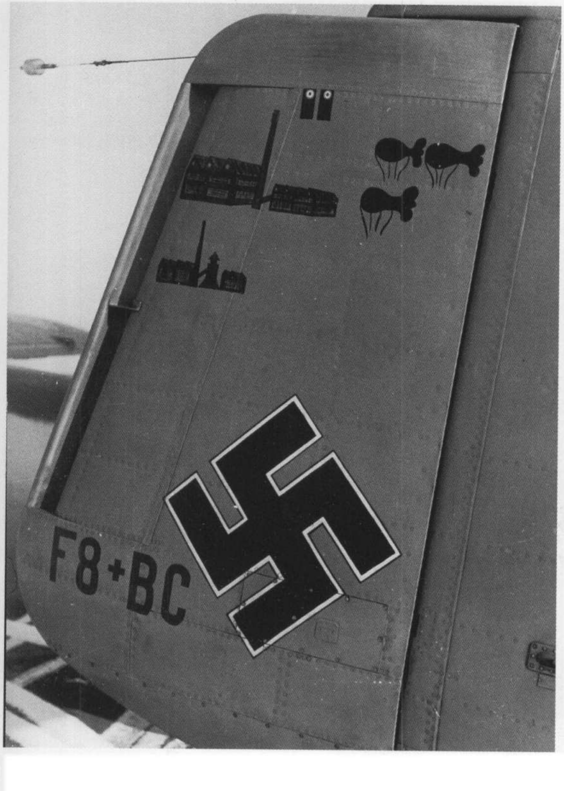


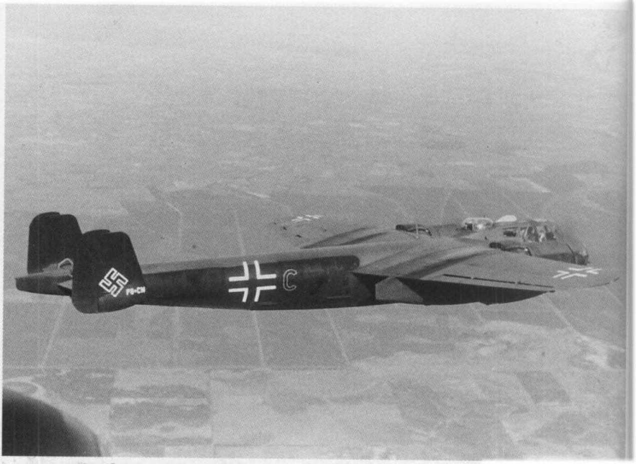
ABOVE: A close-up of the cockpit area of a Do 217 of KG 40, showing the gun turret position fitted with one MG 131 machine gun.

LEFT: A Do 217 E-2, F8+CN, of 5./KG 40 banks away from the formation.



ABOVE: A Do 217 E-2, F8+AP of 6./KG 40 wearing improvised night camouflage, with matt black paint daubed over the national markings.

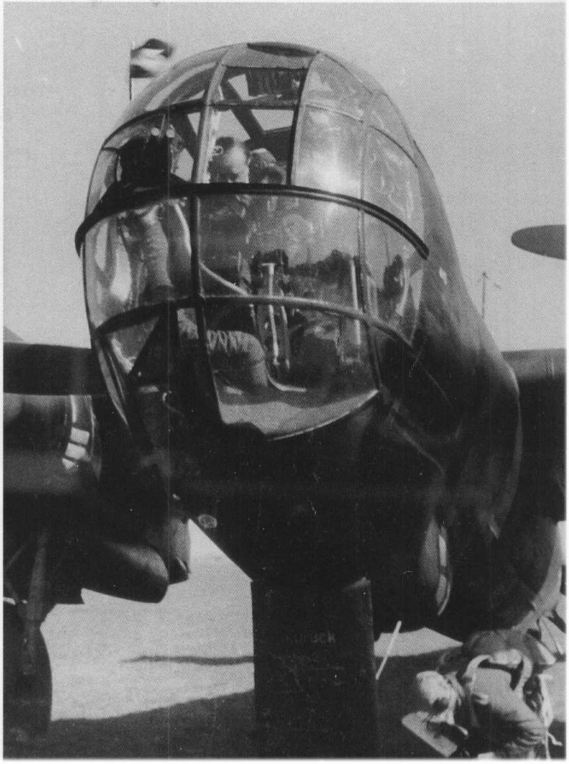


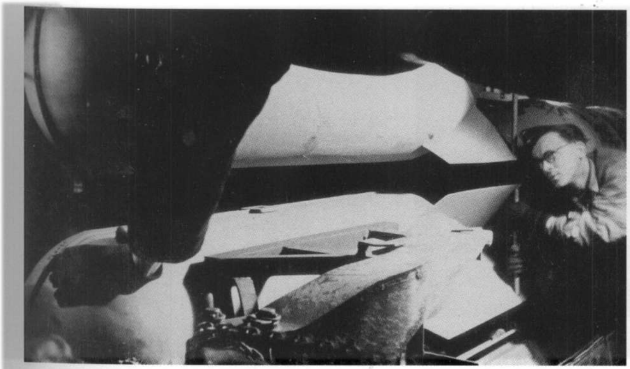


ABOVE: A Do 217 E-2, F8+CN, of 5./KG 40 in regular night camouflage. This unit was the first to receive the new bomber.

LEFT: A Do 217 E coded F8+BC of II./KG 40 employed in daylight nuisance raids against targets in Great Britain. The victory tally on the tail credits the aircraft with either severe damage to or the destruction of two factories, three barrage balloons and two aircraft.

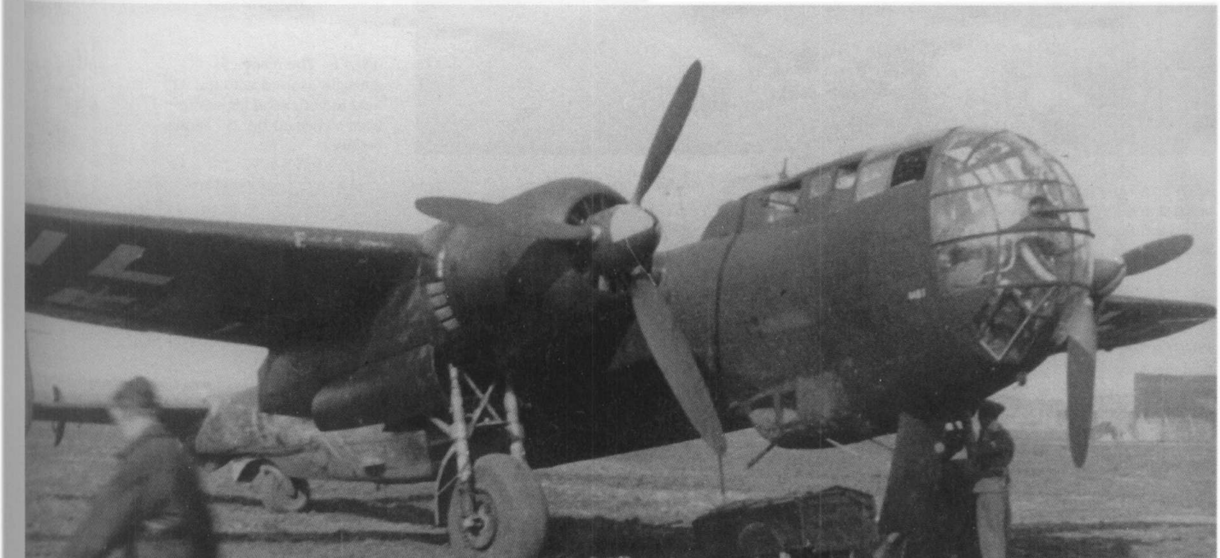
RIGHT: A close-up of the glazed nose section of a Do 217 K. Note the balloon cable-cutting blade running horizontally round the leading edge of the cockpit glazing.

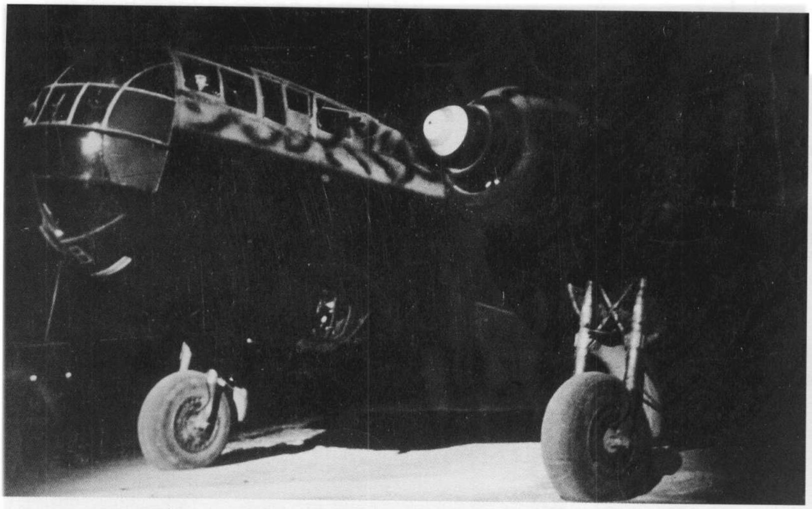




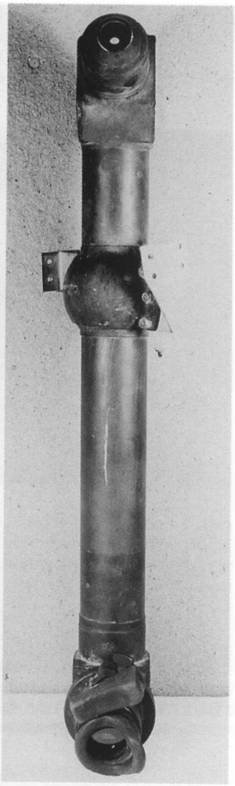
ABOVE: Armourers of KG 2 completing their checks in the bomb bay of a Do 217 prior to a night mission. The ordnance comprises two AB 500 bomb containers, each loaded with 140 x 1 kg (2.4 lb) stick incendiary bombs. At a predetermined height during their fall, the containers opened up to scatter the firebombs in a dense pattern on the ground.

BELOW: A Do 217 K-1 of KG 2. Fitted with a more streamlined nose and more powerful engines, this version, which began operating over Britain during the winter of 1942, was about 32 km/h (20 mph) faster than the earlier 'E' version. This variant was the spearhead of the German bomber offensive against Britain during 1943.

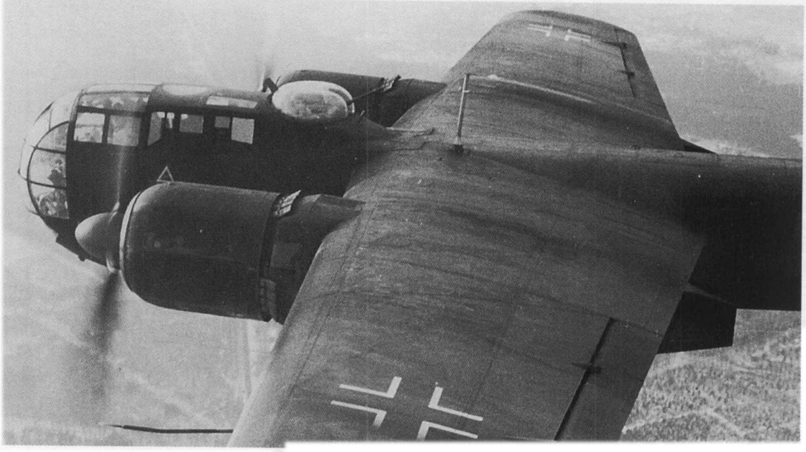




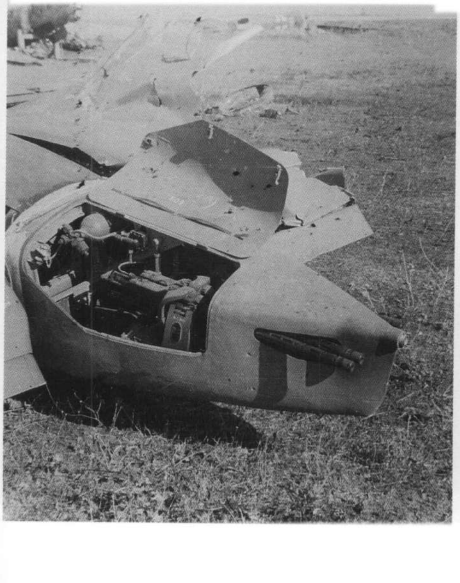
LEFT: A Do 217 K-1 about to take off for a night raid on Great Britain.

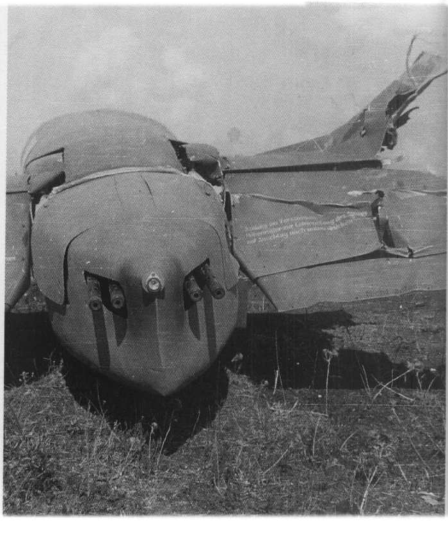


ABOVE: The rear-view gunsight as used with the R23 field modification kit, salvaged from a crashed Do 217 shown below.



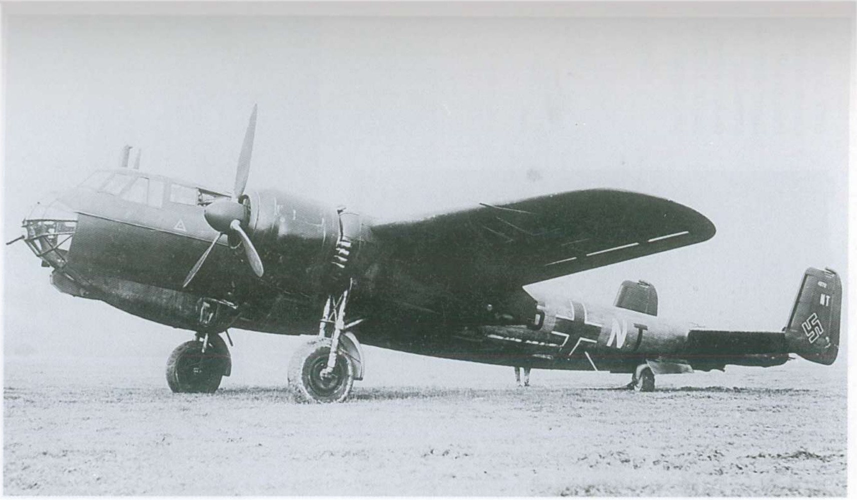
ABOVE: A close-up of a Do 217 K of KG 2 in flight over France taken from another aircraft in the formation.

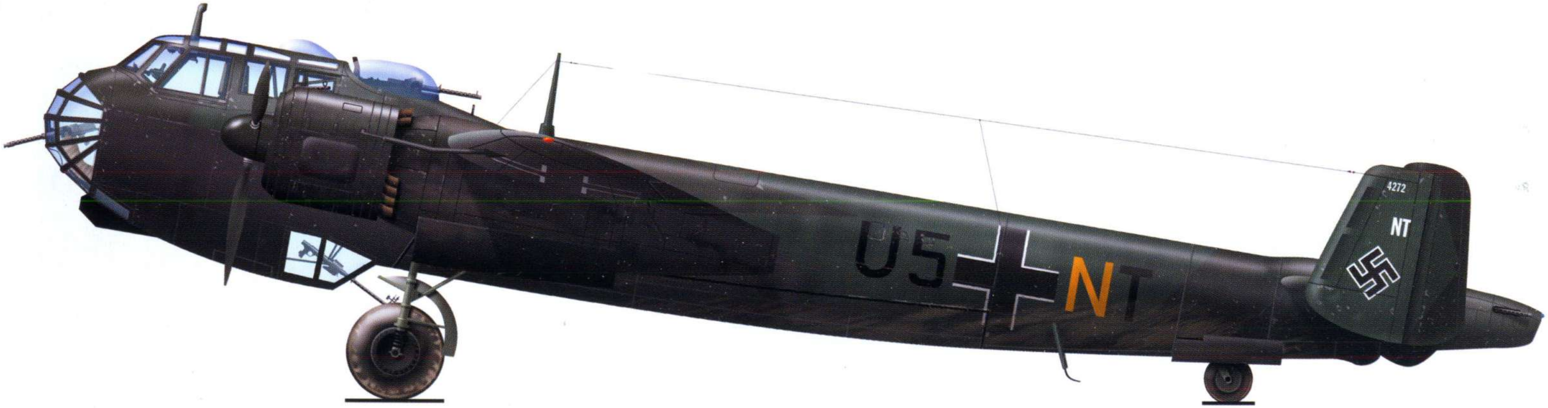




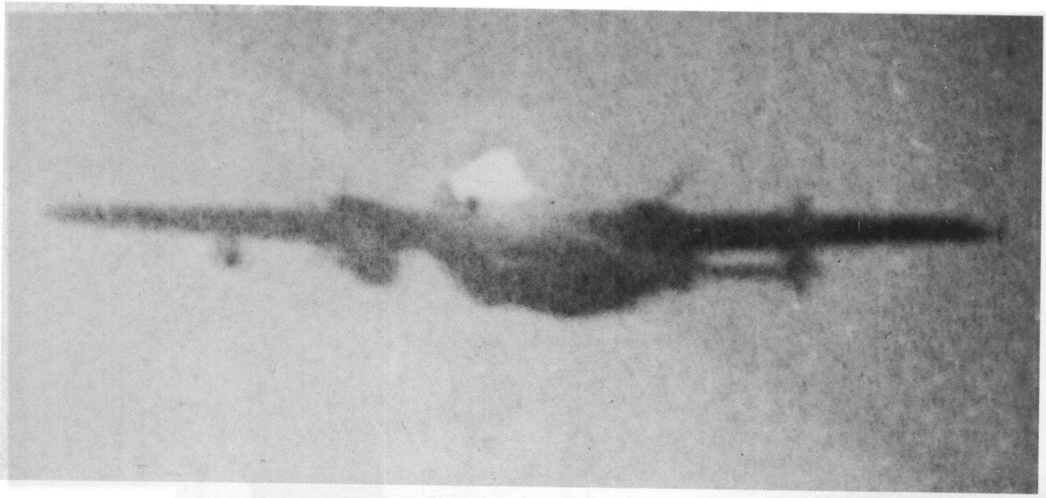
RIGHT AND FAR RIGHT: The R23 field modification kit for the Do 217 provided a replacement tail cone containing four 7.9 mm MG 81 machine-guns in a fixed installation pointing rearwards. The guns were fired electrically from a button on the pilot's control column. The pilot aimed the weapons using a rearward-pointing periscope, which protruded from the cockpit roof and extended downwards just forward and to the right of the pilot's face. The image was reversed and turned upside down, so the pilot had the illusion of firing at an aircraft in front of him.

RIGHT: A Do 217 E of 9./KG 2 fitted with the R23 field modification kit. Note the periscope gunsight protrudin from above the pilot's cabin, and the barrels from the machine guns pointing rearwards from the tail cone. Few Do 217s carried the system, and it is doubtful whether it achieved much success in combat.





Dornier Do 217 E-2/R23 of 9./KG 2 based at Arnhem-Deelen during the winter of 1942/43
This Gruppe flew night bombing sorties over the British Isles at this time and carried temporary black undersurfaces which were the feature of such operations.



LEFT: A gun-camera still taken from an RAF fighter shows hits around the cockpit area on this Do 217 flying over England.

RIGHT: Major Walter Bradel commanded II./KG 2 from the summer of 1942 until March 1943, following which he was appointed to command III. Gruppe and eventually the Geschwader. Returning from a raid on Norwich on the night of 4/5 May 1943, he was engaged near his base at Eindhoven by an RAF intruder aircraft. Bradel was killed during the subsequent crash-landing. He had been awarded the Ritterkreuz whilst Staffelkapitän of 9./KG 2 in September 1941, in recognition of his and his Staffel's offensive operations against enemy armour on the Russian Front.

ABOVE: The funeral cortège for Walter Bradel and members of his crew.

overwhelming concentrations of firebombs posed serious problems for the local fire services.

Following the two attacks on Bath, the raiders visited Norwich on 27/28 April and York on 28th/29th. The '*Baedeker*' attacks continued, with raids on Exeter (again), Norwich, Hull, Poole, Grimsby and Canterbury in May. During June, Ipswich, Poole, Canterbury, Southampton, Norwich (again) and Weston-super-Mare were hit. Birmingham was bombed, as were Middlesbrough and Hull.

Throughout the spring and summer of 1942 the defences took their toll, and the strength of the units taking part in the '*Baedeker*' raids eroded steadily. That August there were attacks on Norwich (yet again), Swansea, Colchester, Ipswich, Portsmouth and Colchester (again); in each case with only small forces.

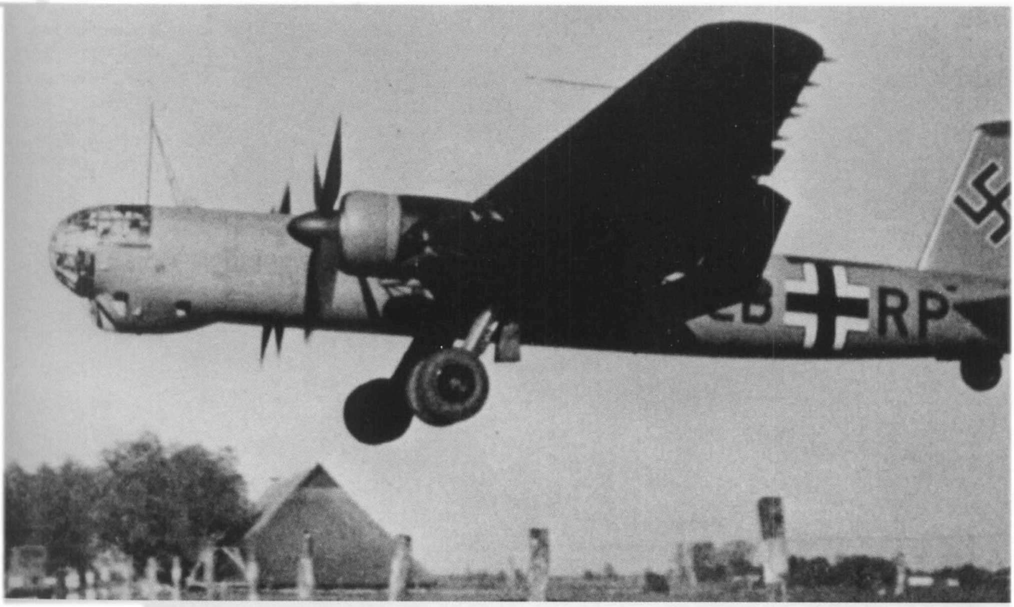
The badly mauled '*Baedeker*' units now needed a short time to rest and recuperate, but did not get it. On 19 August Allied forces launched a large-scale seaborne raid on Dieppe. The Dornier 217s of KG 2 were hurled into the action, and flew 63 daylight sorties against the concentration of Allied shipping. On several occasions the bombers ran into standing patrols of Allied fighters, and the *Geschwader* lost 14 aircraft and 12 crews, nearly a quarter of its current strength. A further 12 Dorniers returned with severe battle damage.

By the end of the Dieppe action KG 2 was down to about 12 combat ready crews and had been reduced to a state of near impotence. However, after this nadir in its fortunes, the *Geschwader* was slowly able to built up its strength as replacement crews arrived. Having started 1942 with around 88 combat ready crews, by September KG 2 was left with only 23 crews. About half of these had come straight from training schools and lacked combat experience. That weakness was reflected in the unit's operational ability, and during September 1942, KG 2 mounted only two night raids, one on Sunderland and other on King's Lynn, both with few aircraft. The latter raid marked the end of this phase of the campaign against Great Britain.

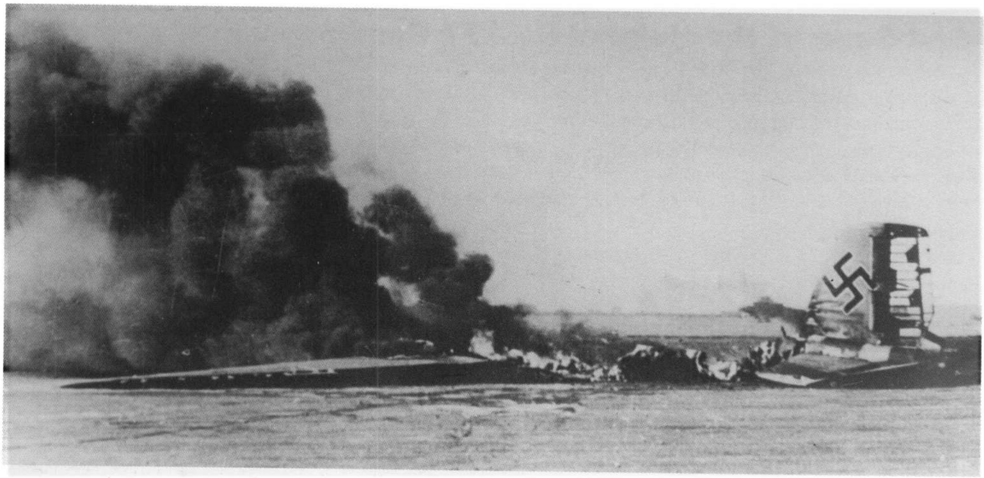
The Sad Saga of the Heinkel He 177 Bomber

In July 1942 a total of 34 of the new He 177A-1 heavy bomber was delivered to the I. *Gruppe* of *Kampfgeschwader* 40 at Bordeaux/Merignac in France. Their brief was to test the aircraft under operational conditions. The unit soon pronounced the type unsuitable for operational use in its current form. The engine lubrication and overheating problems were especially bad, and the wing structure was found to be somewhat weaker than specified. There were several other, smaller, failings and the He 177A-1 was withdrawn from front line service. Thereafter, the A-1 version was restricted to training and other second line duties.

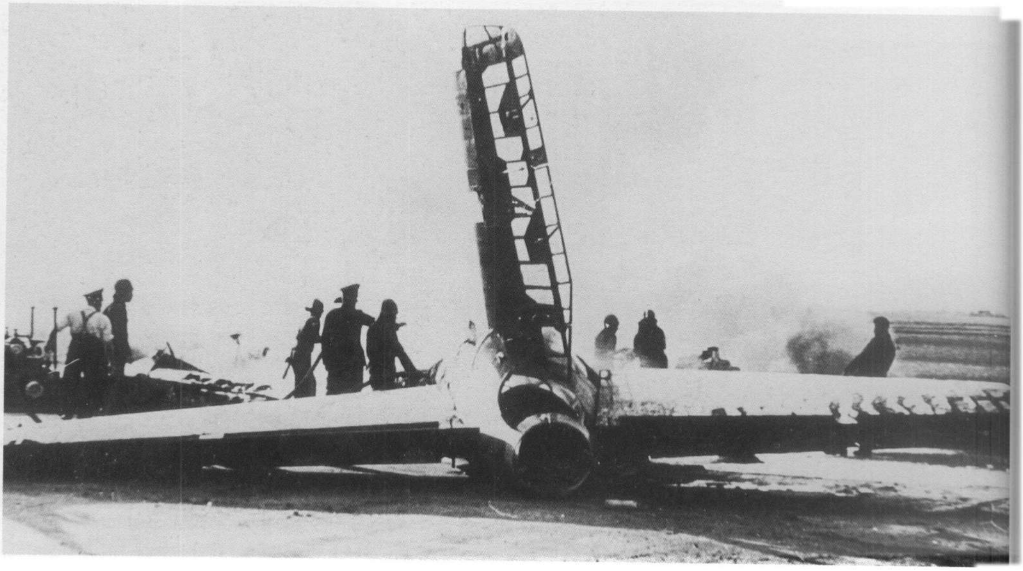
The prototype Heinkel He 177 four-engined bomber had made its initial flight on 19 November 1939, three months after the outbreak of the Second World War. Thus its maiden flight took place after that of the British Short Stirling but before that of the Handley Page Halifax and the Avro Lancaster; after that of the American B-17 Flying Fortress but before that of the B-24 Liberator. Yet in September 1943, by which time all the Allied types mentioned above were in service in large numbers, the Heinkel 177 bomber had still to make any impact on the conflict.



LEFT AND BELOW: With Flugkapitän Fritz Schäfer at the controls, the first prototype of the He 177, CB+RP, comes in to land during a test-flight at Rostock-Marienehe. The aircraft made its first flight on 11 November 1939 with Lt. Carl Francke at the controls. The flight lasted 20 minutes during which time the undercarriage was not retracted. During the flight, several problematic characteristics were noted, these including the heavy controls of the rudder and ailerons, but also most importantly, the oil temperature gauges indicated severe overheating of the DB 606 engines.

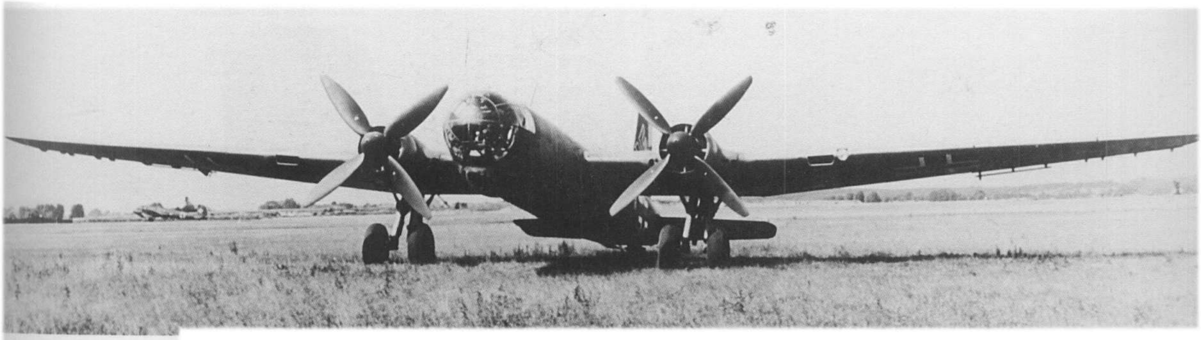


LEFT AND BELOW: The end of the first prototype He 177, CB+RP, as seen on 3 October 1941, when it crashed and burst into flames on landing.

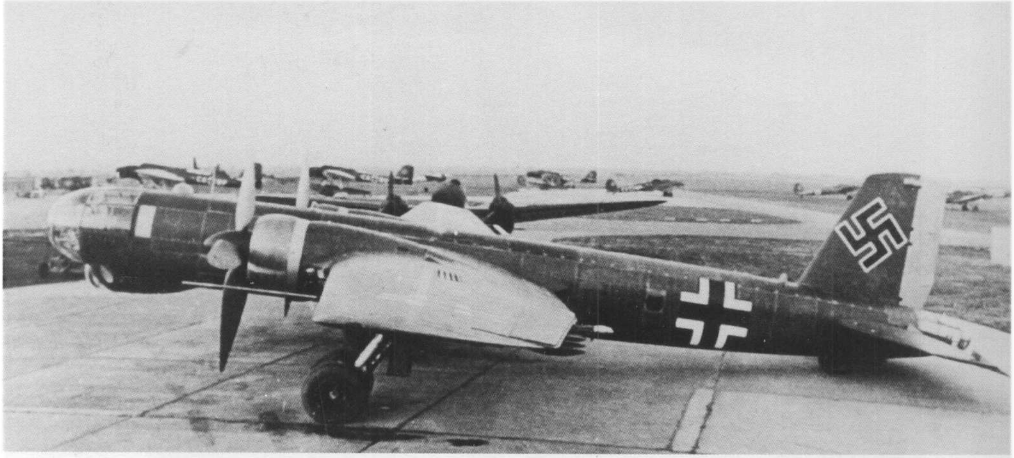


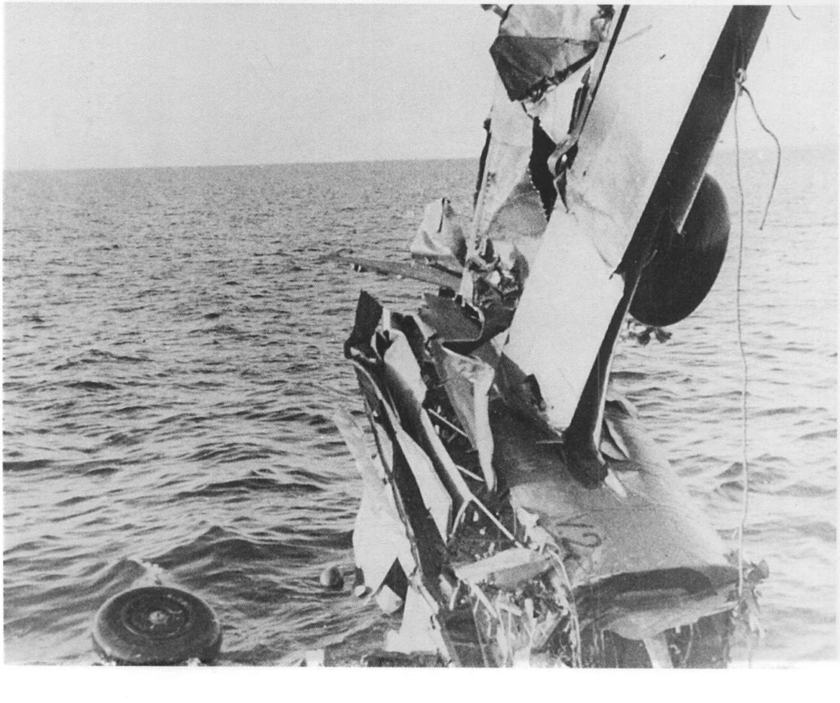
The root cause of the He 177's problems was that in its requirement for a long-range bomber, the *Luftwaffe* specification had demanded too much. To meet those requirements Heinkel had been forced to employ several new and untried features into the design. In retrospect, we can see that there were too many. In its initial form the He 177 was required to be capable of dive attacks at an angle of 50 degrees. It soon became clear that the bomber was too large to perform this manoeuvre without a severe risk of overstressing the airframe as it pulled out of the dive. As a result, the dive-bombing requirement was dropped early in the test programme, but the design features introduced to make it possible remained. The coupled engine arrangement was one of the features chosen to help give the bomber the manoeuvrability required for diving attacks. Although at first glance the He 177 looked like a twin-engined aircraft, the aircraft had four Daimler Benz DB 601s mounted side by side in pairs in each engine nacelle. The coupled engine arrangement was designated the DB 606, rated at 2,700 horsepower for take-off. Each pair of engines drove a single four-bladed propeller through a connecting gear train. A clutch mechanism allowed either engine to be shut down in flight, allowing the aircraft to cruise on two engines to extend its endurance.

Mounting the engines in coupled installations in this way gave an aerodynamically neat arrangement, which gave less drag than placing the four engines in separate nacelles along the wing.



ABOVE AND RIGHT: The He 177 V2 had improved fin and rudder controls and is seen here at Rostock-Marienehe prior to its first flight and without its call sign of CB+RQ in 1940.

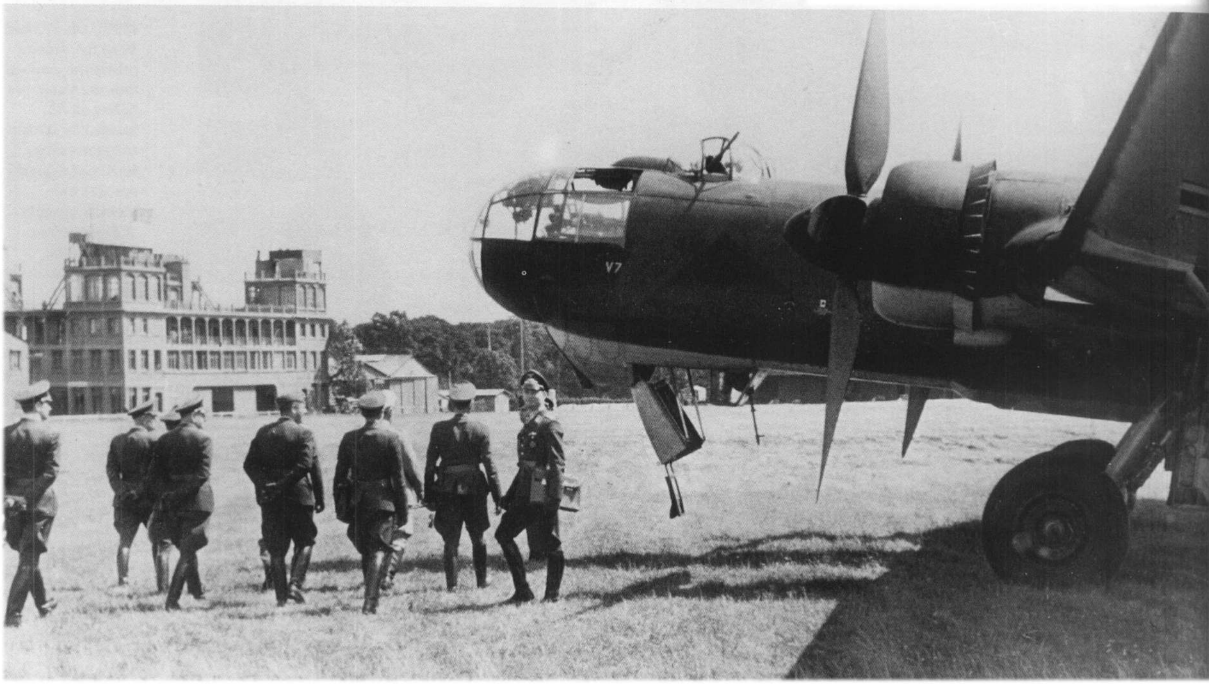


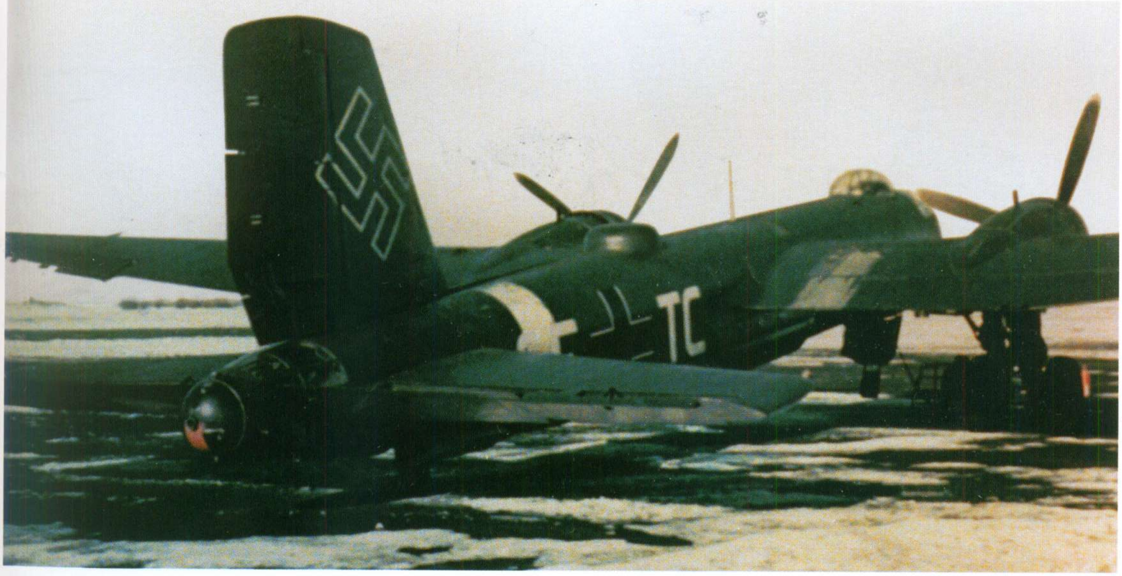


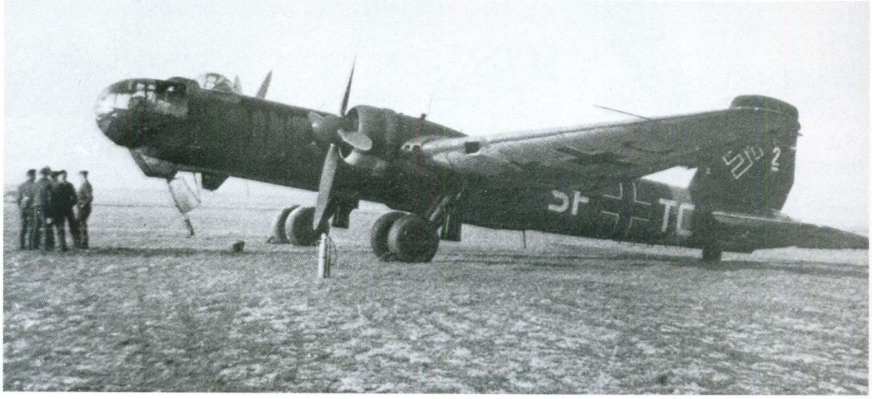
LEFT: On 27 June 1940 the second prototype crashed into the Baltic Sea killing all on board. The remains are here being retrieved from the sea and the identity number 'V2' painted in black can be clearly seen on the side of the fuselage.

LEFT: This photograph of the He 177 V4 was taken from its cockpit just after take-off as the undercarriage was being retracted. The prototype was the fourth aircraft of the type to be destroyed on 8 June 1941 due to Allied action.

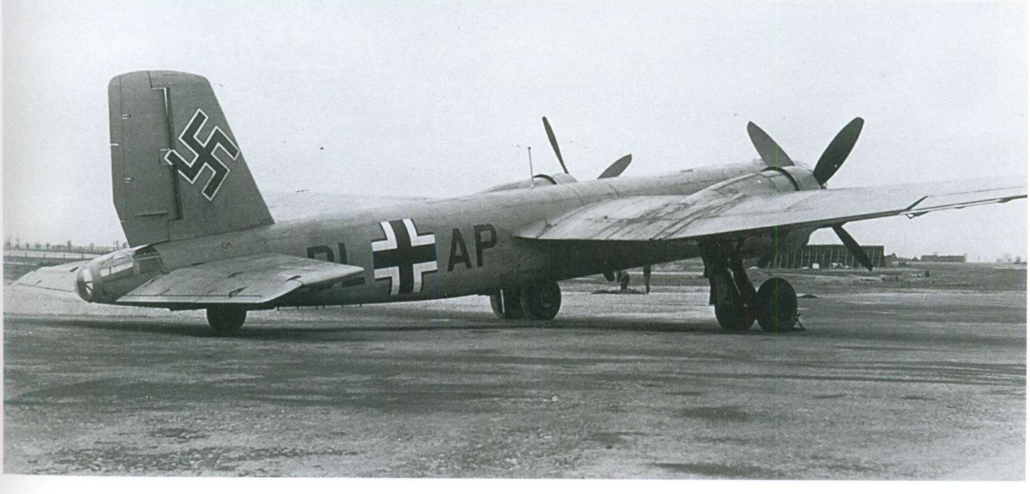
BELOW: The He 177 V7, coded SF+TB, was sent to the Erprobungsstelle at Rechlin for evaluation, where it was inspected by Reichsmarschall Hermann Göring seen here wearing the light coloured uniform and walking in front of the entourage. The officer turning to face the camera is Oberst Edgar Petersen, head of the test centre and formerly the first Kommodore of KG 40. The He 177 V7 was later used as a training aircraft with KG 40.



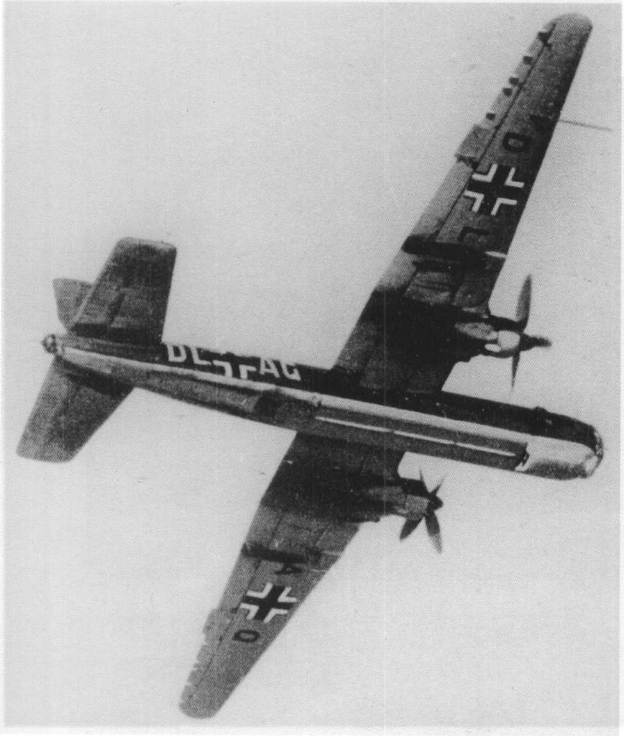


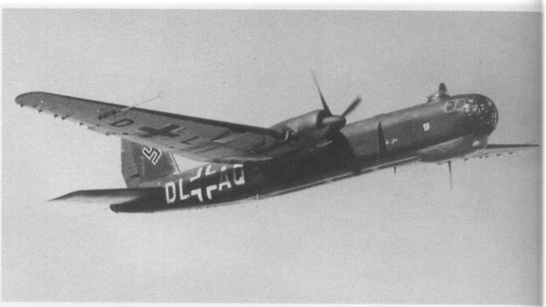


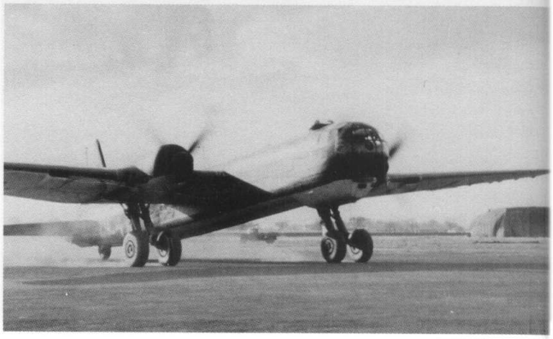
ABOVE AND RIGHT: This prototype, the He 177 V8, W.Nr. 000008 and coded SF+TC (in white), was used as a test aircraft by the Heinkel works at Rostock-Marienehe although its final fate is unknown. The Hakenkreuz on the fin has been applied out of proportion with the gap of the upper front hook, it being wider than the standard specification.



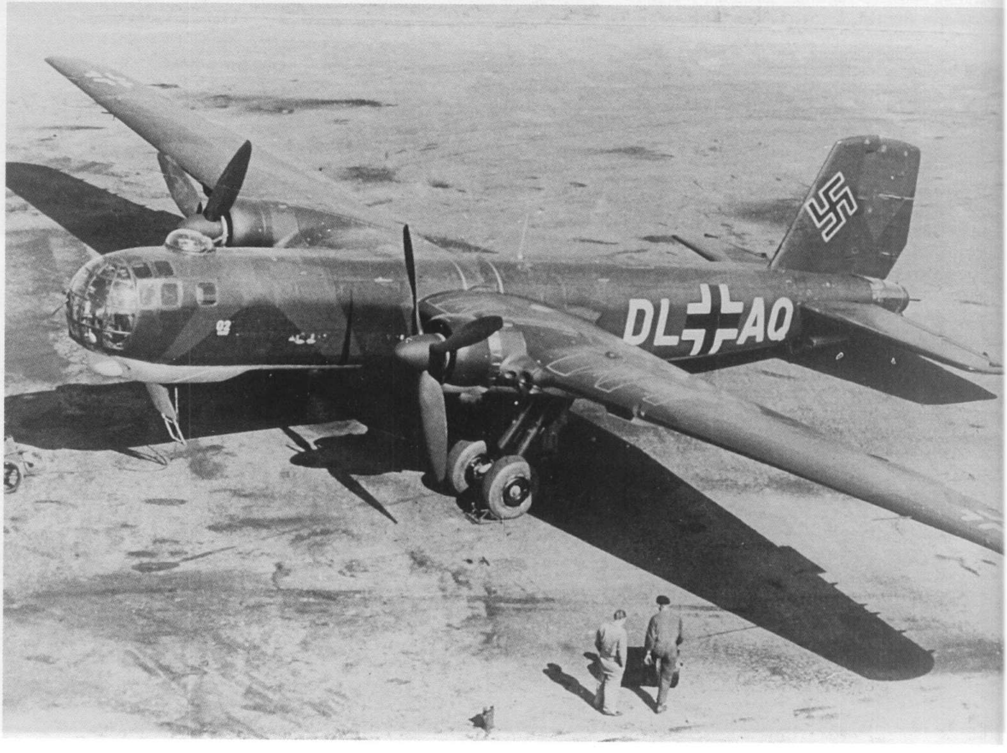
LEFT: The first of the pre-production batch of aircraft known as the He 177 A-01, was W.Nr. 000016, coded DL+AP (in black). It was destroyed during a take-off accident on 8 July 1941. The aircraft appears to be painted all over in RLM Grey 02.

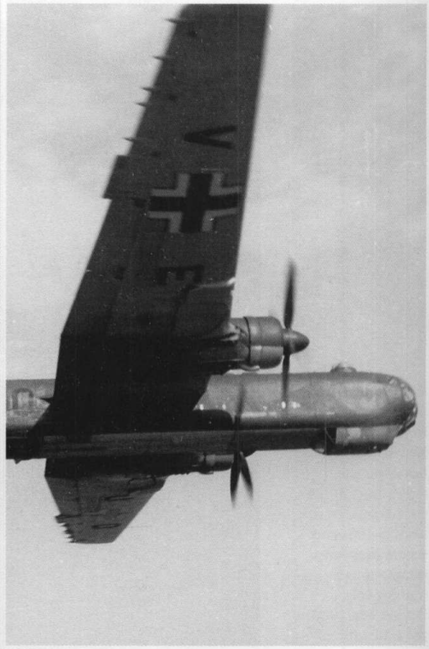




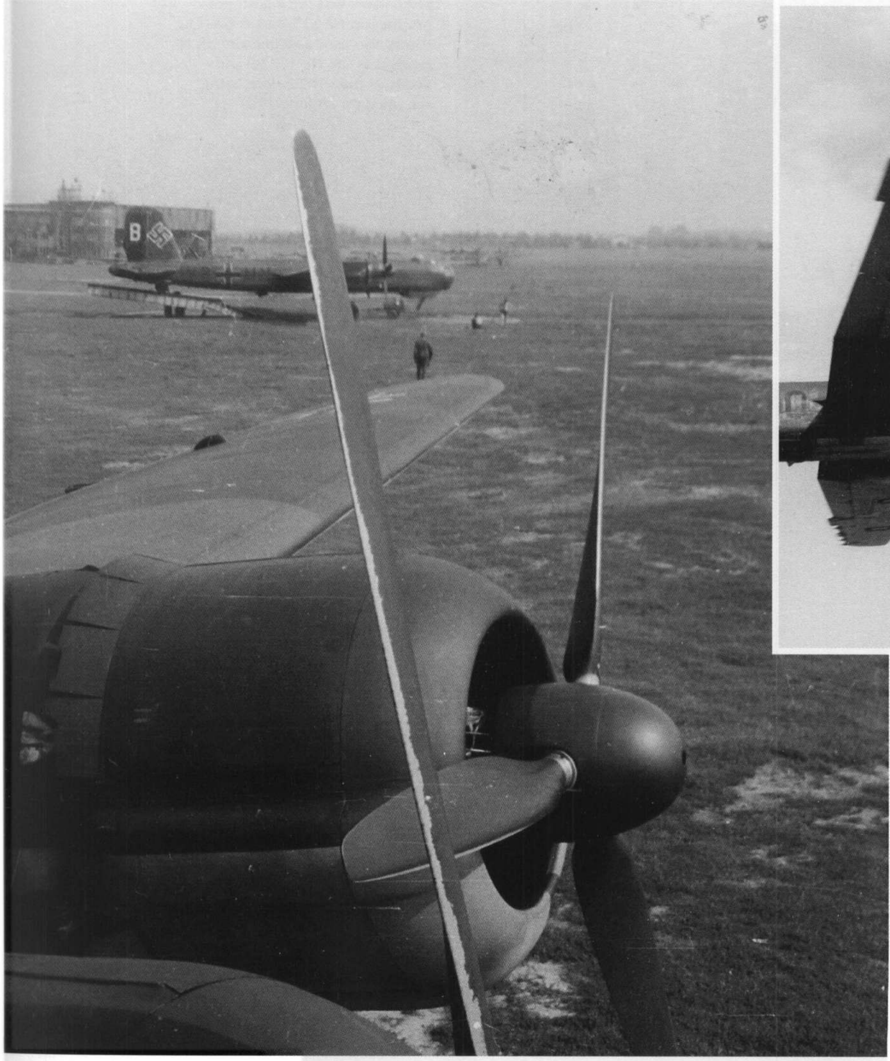


THIS PAGE: The Heinkel He 177 was intended to become the standard four-engined heavy bomber for the Luftwaffe. This unusual design featured two engines on each wing coupled together as one driving a single airscrew. This gave the aircraft the appearance of a twin-engined machine, and produced a low-drag aerodynamic configuration. The machine seen here was the second pre-production aircraft, He 177 A-02, coded DL+AQ (in white). It was tested at Rechlin but its ultimate fate is unknown.

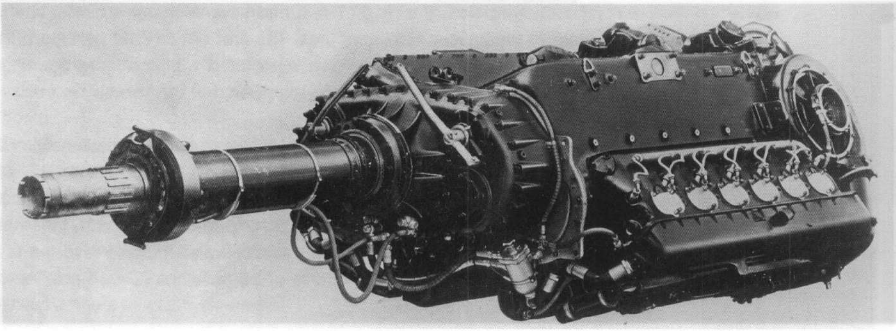




ABOVE: This He 177 A-1, W.Nr. 15215, coded VE+UO was one of eight machines assigned to the Erprobungsstaffel 177 at the Rechlin test centre. It was totally destroyed in a crash on 21 December 1942.

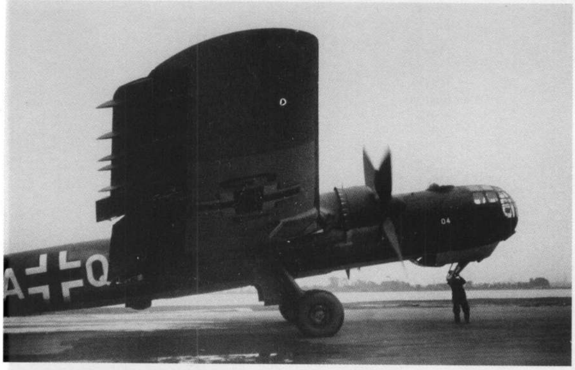


ABOVE: Seen on a compass configuration ring at the Erprobungsstelle Rechlin, this machine was attached to the Erprobungsstaffel 177. This He 177 A-1, W.Nr. 15214, coded VE+UN, was amongst a batch produced by the Arado company and was destroyed during a test flight on 28 May 1943.

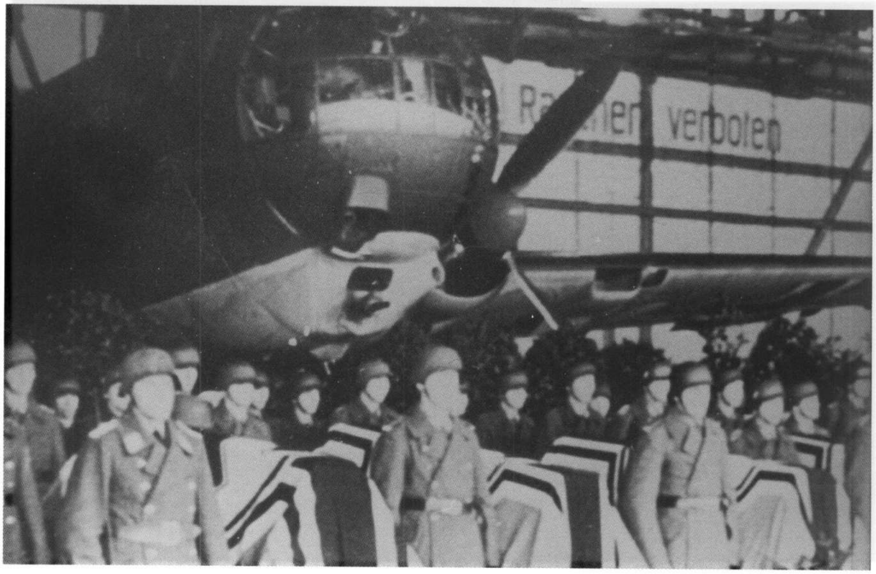


ABOVE: The Daimler Benz DB 610 coupled engine fitted to most He 177s after the initial production batch. The DB 610 employed two DB 605 engines driving a single propeller via a clutch mechanism and a joint gearbox. This coupled engine arrangement gave constant trouble, however, and incurred severe lubrication and cooling problems.

January 1942-September 1943



LEFT: This was the eighth pre-production He 177, coded GA+QQ. It was also used as a test aircraft by Heinkel as the He 177 V9 and finally as the V102 before being scrapped on 28 June 1943.



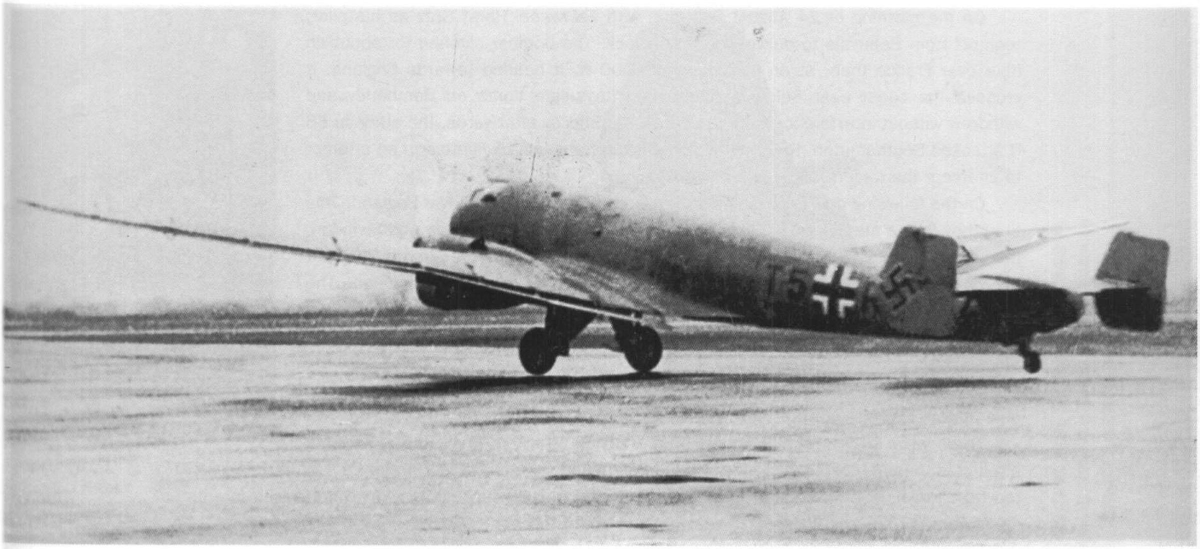
RIGHT: After the failure of the He 177 with KG 40 in France on July 1942 the remaining aircraft were transferred back to Germany where they were relegated to a training role. During late 1942 the I. Gruppe of Ergänzungs Kampfgeschwader 50 received their first batch of He 177 A-3s. However accidents were frequent as were funeral ceremonies from the consequences.

Yet, from the start, the arrangement caused a host of problems. There were serious problems with engines seizing up due to poor lubrication, or overheating and catching fire. During the flight test programme three out of the first five He 177 prototypes, and their crews, were lost in crashes. Already the new bomber had carved out an unfortunate reputation for itself.

The next production version, the He 177 A-3, had several changes aimed at improving handling, and removing some of the causes of engine fires. The first fifteen A-3s built were fitted with DB 606 engines. The sixteenth and subsequent aircraft were fitted with the more powerful DB 610, which comprised two DB 605 engines coupled together in the same manner and developed 2,950 horsepower.

Late in 1942, the I. *Gruppe* of *Ergänzungskampfgeschwader* (Replacement or Reserve Training Bomber *Geschwader*) 50, based at Brandenburg/Briest, received twenty He 177 A-3s off the production line. The unit was re-designated I./KG 50 and part of it went to Zaporozh'ye in Russia for winter trials. Some of the aircraft took part in the Stalingrad airlift, but with little empty space in the fuselage the new bomber was unsuitable for the transport role. The type reverted to the bomber role, but its reliability problems remained. In the course of 13 missions seven He 177s were lost, none of which was attributed to enemy action.

In February 1943, I./KG 50 withdrew to Germany, and for the next eight months the heavy bomber underwent a lengthy programme of modifications aimed at alleviating its faults. That programme was still in progress in September 1943, the end of the period covered in this book. The later service career of the Heinkel He 177 will be described in the next Volume of this series.



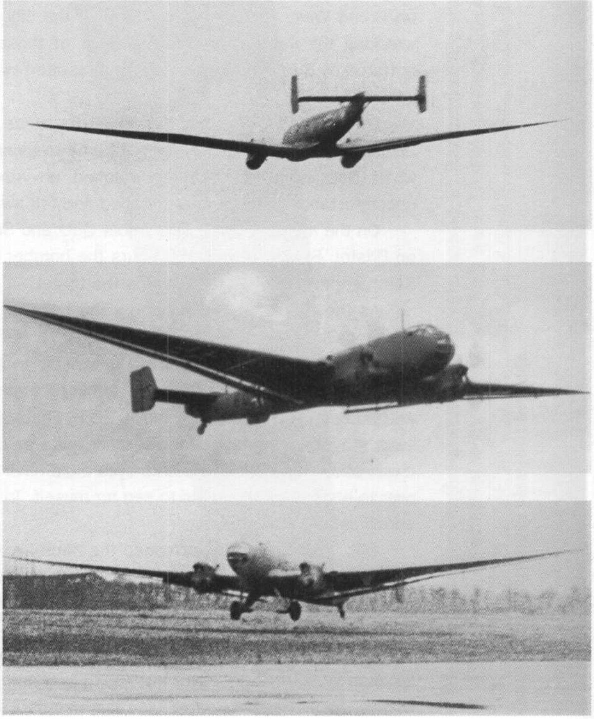
ABOVE: This Ju 86 R-1, almost certainly coded T5+RM, was flown operationally by Ofw. Horst Götz during his time with the Versuchsstelle für Höhenflug.

Stratospheric Raiders

During 1942 the *Luftwaffe* took delivery of a few examples of a new ultra high-altitude bomber, the Junkers 86 R. Based on the design of a bomber that had been obsolescent at the beginning of the war, the Ju 86 R version was a major redesign with a pointed wing with a span of 32 m (almost 105 ft), an increase of some 30 ft over that of the original aircraft. The gun positions were faired over and the two-man crew was housed in a fully pressurised cabin (it would be the first bomber to enter service to have this refinement). The Ju 86 R was fitted with Jumo 207 two-stroke compression ignition diesel engines, their power boosted at high-altitude by exhaust-driven turbo-superchargers and nitrous oxide injection.

The Junkers 86 R carried no defensive armament and it cruised at a true airspeed of only 290 km/h (180 mph). For its survival it relied solely on its outstanding altitude performance: it could cruise at heights above 12,000 m (40,000 ft). For attacks from such altitudes, however, its offensive load was limited to a single 250 kg (550 lb) bomb.

During July 1942 two Ju 86 Rs were issued to the *Luftwaffe* High Command's high-altitude trials unit, *Höhenkampfkommando der Versuchsstelle für Höhenflüge*. Tests at the research establishment at Oranienburg proved the feasibility of delivering bombs from altitudes over 12,200 m (40,000 ft). In mid-August the two bombers moved to Beauvais in northern France in preparation for a series of experimental high-altitude daylight attacks on England. Commanded by *Leutnant* Erich Sommer, the unit was to mount its raids by day.



ABOVE THREE PHOTOGRAPHS: During 1942 a pair of Junkers Ju 86 R high-altitude bombers carried out nuisance attacks on targets in England. This variant had a longer span wing and employed nitrous oxide injection to improve the high-altitude performance of the aircraft's diesel engines. Cruising at altitudes above 12,000 metres (40,000 ft), these aircraft could carry only one SC 250 bomb. On 12 September 1942, one of these aircraft, T5+PM, was intercepted over Southampton by a specially modified Spitfire IX, which attacked the Junkers and hit its port wing with a single 20 mm round. The bullet passed through the German aircraft without serious damage. The raider had been fortunate to escape the encounter and, after this engagement, the attacks ceased.

On the morning of 24 August Sommer, with *Feldwebel* Horst Götz as his pilot, took off from Beauvais to deliver the first attack. The bomber climbed for about an hour over France then, at an altitude of 39,000 ft, it headed towards England. It crossed the coast near Selsey Bill, dropped its single bomb on Camberley and withdrew without interference from the defences. Shortly afterwards, the other Ju 86 R attacked Southampton. RAF Fighter Command scrambled 15 fighters in an attempt to intercept the raiders, but without success.

On the following day, Erich Sommer and Horst Götz were again over England. This time they flew a meandering course that took them over Southampton and Swindon, then round the north of London to Stansted where they released their bomb. They left the coast near Shoreham, having spent more than an hour over England. The intention had been to sound as many sirens as possible, and cause maximum disruption and loss of production. The defenders refused to play that game, however. Single intruders were treated as reconnaissance aircraft not carrying bombs, and the sirens remained silent. Nine Spitfires took off to engage the bomber, but none was able to get close to it.

ABOVE: Ofw. Horst Götz piloted the Ju 86 R during the action on 12 September 1942. He is seen here later in the war, when he held the rank of Oberleutnant.

Three days later, on 28 August, a Ju 86 R attacked Bristol. Six Spitfires attempted to intercept it but found the raider, identified variously as a 'Dornier 217' or a 'Heinkel 177', too high for them. By now the bombers' crews had become accustomed to watching as interested spectators, as fighters sent after them tumbled out of the sky several thousand feet below.

The policy of not sounding the sirens for single intruders was a calculated risk, justifiable in wartime, but on this occasion the citizens of Bristol paid the penalty. The single 550 lb bomb landed on Broad Weir, almost in the centre of the city, close to three buses. It exploded without warning, wrecking the vehicles and killing most of those on board. It was the worst single bomb incident suffered by Bristol during the war and resulted in 48 people killed, 26 seriously injured and 30 slightly wounded.

Over the next ten days the Ju 86 Rs made eight further attacks on southern England. The nearest either aircraft came to being intercepted was on 6 September, when Götz and his observer watched an American P-38 Lightning fighter get uncomfortably close, before it stalled and fell away.

On the morning of 12 September Götz and Sommer took off for a further attack on Bristol. Shortly after 0950 hours the bomber crossed the coast of England near Southampton and headed towards the target.

As the Ju 86 neared Salisbury the calm on board was rudely shattered. Götz later recalled:

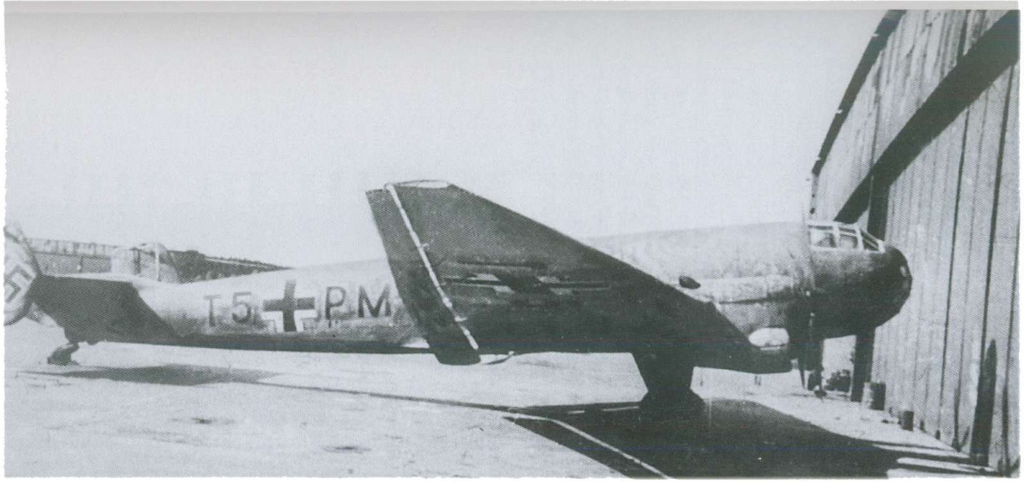
"Suddenly Erich, sitting to my right, said that there was a fighter closing on us from his side. I thought there was nothing remarkable about that: almost every time we had been over England in the Ju 86 R, fighters had tried to intercept us. Then, he said, the fighter was climbing very fast and was nearly at our altitude; the next thing it was above us. I thought Erich's eyes must have been playing him tricks, so I leaned over to his side of the cabin to see for myself. To my horror I saw the Spitfire, a little above us and still climbing."

Götz acted fast. He jettisoned the bomb, switched in nitrous oxide boosting to increase engine power then, after his and Sommer's oxygen masks were clamped on, he depressurised the cabin so that there would be no risk of an explosive decompression if it was hit. Then he tried to out-climb his assailant.

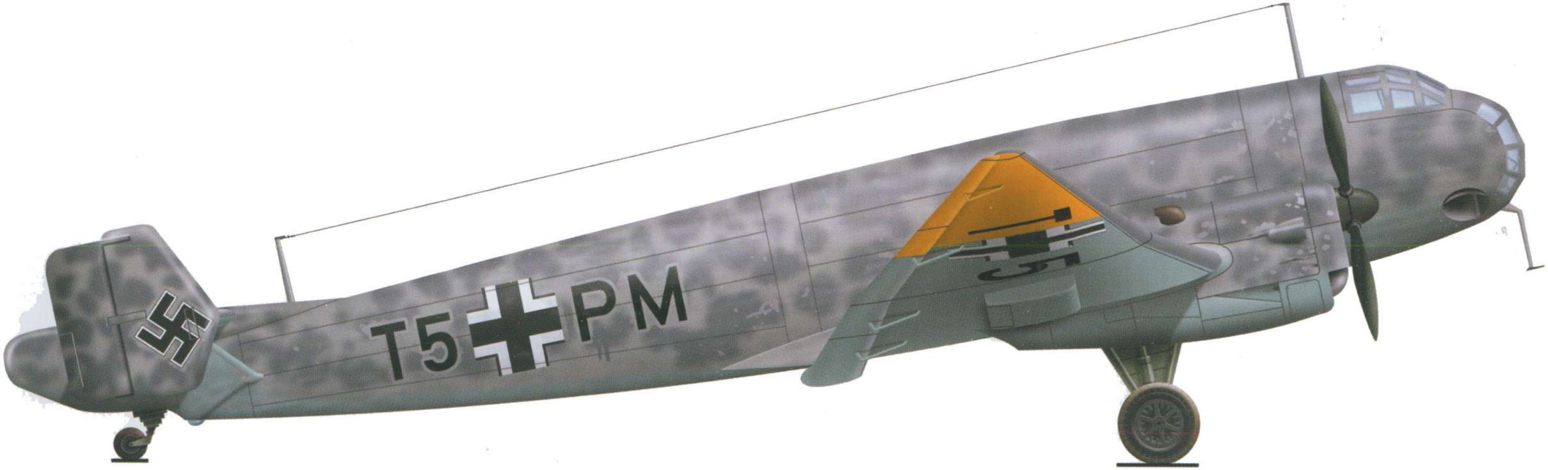
ABOVE: Leutnant Erich Sommer flew as observer in the Ju 86 R.

The pilot of the Spitfire was Pilot Officer Emanuel Galitzine of the Special Service Flight based at Northolt formed to deal with the new threat. He flew an example of the latest Mark IX version of the Spitfire, which had been lightened and modified to enhance its high-altitude performance.

Galitzine watched the bomb fall away and saw the Junkers begin its climb for survival, but in the race for altitude he found little difficulty in overhauling his foe. He climbed to a position 92 m (300 ft) up-sun of his quarry, then dived to attack. Galitzine closed to 183 m (200 yards) astern and opened fire with his two 20 mm cannon. One round struck the port wing of the Junkers and went clean through from rear to front without striking anything vital. Almost immediately afterwards, the Spitfire's port cannon jammed. Whenever Galitzine pressed the firing button the starboard cannon continued firing, but its recoil forces caused the fighter to yaw to the right and lose altitude. Then the Spitfire passed through the bomber's wake and its cockpit canopy misted over.

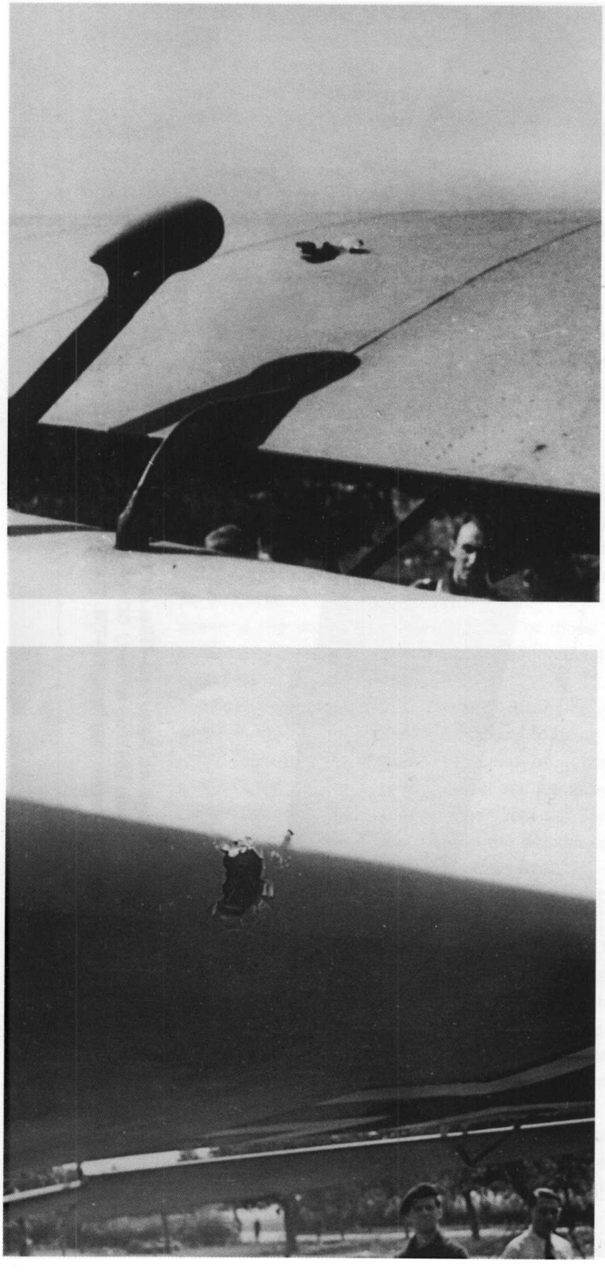


LEFT: This Ju 86 R, coded T5+PM, was attached to Höhenflugkommando Beauvais and was flown by Horst Götz with Erich Sommer as navigator on 12 September 1942 on a high altitude bombing mission over Bristol. It was intercepted by a specially modified Spitfire IX piloted by the Russian Prince Emanuel Galitzine who managed to damage the Ju 86 in the wing.



Junkers Ju 86 R-1 of Höhenflugkommando Beauvais based at Beauvais-Tille during August and September 1942

This was one of four Ju 86 Rs attacked to Sommer's unit. They were: T5+PM - formerly CC+AK normally flown by Götz, T5+QM flown by Werner Altrogge, T5+RM flown occasionally by both pilots and a reserve machine, T5+TM. Many of the unit's aircraft had pale grey (RLM 77) uppersurfaces with pale blue (65) beneath.



ABOVE AND TOP: The entry and exit holes in the wing of the Ju 86 R caused by the 20 mm round fired by a Spitfire over England on 12 September 1942.

The Spitfire's canopy took some time to clear, and when Galitzine next saw the Junkers it was heading away to the south out to sea. Again he climbed above the bomber, then dived to attack it from out of the sun. But Götz demonstrated a skill born of years of flying experience. Each time, as the Spitfire neared firing range, he pulled the Junkers into as tight a turn as the rarefied air allowed. Whenever Galitzine opened fire with his remaining cannon, the Spitfire yawed uncontrollably to the right. Then his windscreen misted over again, and he had to break off the assault.

Götz struggled to shake off his tormentor. Thus far luck had been on his side, but suddenly it seemed to desert him. His diesel engines had been giving their maximum power for too long. Now one of them started to lose power and it left a trail of unburned fuel. Götz thought his last moment had come. His only defence was to stay at high altitude and outmanoeuvre his adversary. Now he could no longer do either. In one last bid for survival, he eased down the nose of the Junkers, hoping to convince his adversary that the bomber had been hit and was falling out of control.

As Galitzine's windscreen cleared, he saw the bomber descending into a patch of mist. But he could also see the north coast of France getting disconcertingly close. Reluctantly he broke off the action and turned north for home.

So ended what was almost certainly the highest air action fought during the Second World War. Suspecting that his aircraft had been hit, Götz landed the Ju 86 R at Caen. On the ground, a quick inspection revealed the entry and exit holes the cannon shell had made as it passed through the wing. Satisfied that nothing vital had been hit, the crew took off again and returned to Beauvais.

The unique interception caused a ripple of excitement through the *Luftwaffe* High Command. Götz later commented:

'Several senior officers came to visit us at Beauvais to talk about it. Some even expressed doubts that we could possibly have been attacked by a British fighter at such a high altitude. 'Well,' I told them, 'we did not make that hole in the wing ourselves!'

The result was that the *Luftwaffe* ended its ultra high-altitude bombing attacks on Britain. The Ju 86 R could carry just a single 250 kg (550 lb) bomb on each sortie, so the attacks had value only if they could be made without suffering losses. Now it was clear it would be only a matter of time before a Ju 86 R was shot down.

So ended the remarkable series of ultra high-altitude raids on Britain. Technically, they are of great interest: not until well into the jet age would bombing attacks from such altitudes be possible as a matter of course. Militarily, however, they achieved little. Altogether the two Ju 86 Rs dropped 14 bombs on Britain. Only one of those, the one that landed in the centre of Bristol, caused serious damage or loss of life.

January 1942-September 1943

The Night Raids Continue

In its efforts to find the Achilles heel of the British defences, the *Luftwaffe* tried almost every possible stratagem. Sheer height had not been enough to render attacking aircraft immune to interception, nor was the cover of darkness. Raids by fighter-bombers on targets on or close to the coast continued, but these fall outside the purview of this account. During 1942, 3,236 people were killed and 4,148 suffered serious injuries as a result of the bombing attacks on Britain. These figures were rather less than one-fifth of those for the previous year. In the course of 1942 the British air defences had continued to grow stronger, and had demonstrated, that they could inflict punishing losses on raiding forces.

Throughout 1942 the *Luftwaffe* bomber force in the West had been a declining asset, starved of resources. Now all of that was about to change. The *Luftwaffe* High Command had laid plans for a resumption of large-scale attacks on Britain early in the New Year. To that end it brought KG 2 up to full strength in aircraft and crews, and brought in another *Geschwader* to reinforce it.

ABOVE: Major Hermann Schmidt served with KGr 100 early in the war and became an expert in radio navigational systems. After a spell as commander of a Blindflugschule (Blind flying school) at Radom, in April 1943 he was appointed commander of the Pathfinder unit I./KG 66.

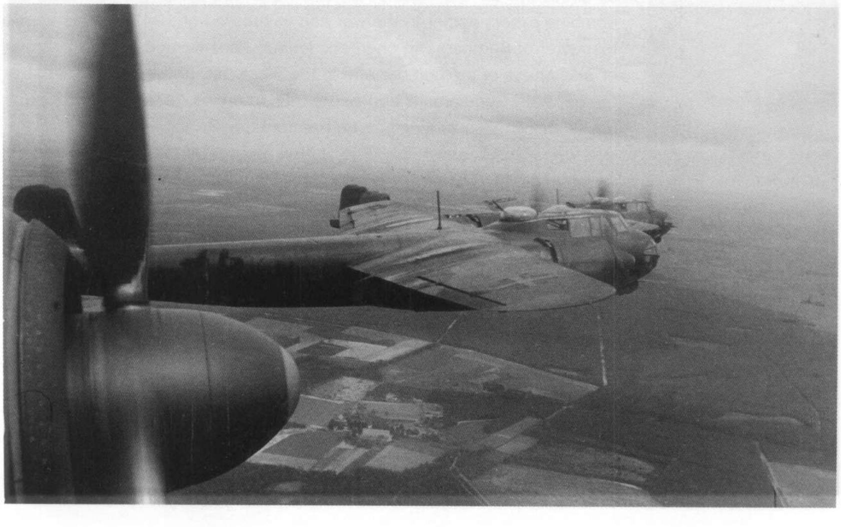
In mid-January 1943, the force of twin-engined bombers available to Luftflotte 3 for the attacks on Britain comprised some 60 Dornier 217s of KG 2 and a similar number of Junkers 88s of KG 6. KG 6 had been formed in September 1942, the I. *Gruppe* from I./KG 77, the II. *Gruppe* from KGr 106 and the III. *Gruppe* from III./LG 1. A IV. *Ergänzungsgruppe* was also added in September and three independent *Staffeln* were formed. 14./KG 6 was a cover designation for Sommer's *Höhenkampfkommando* which eventually became 6.(F)/123; 15./KG 6 was a pathfinder unit formed from *Erprobungskommando* 17 which later formed the basis of I./KG 66, and 16./KG 6 was an experimental Me 210 unit formed from *Erprobungskommando* 210.

By that time KG 2 had largely re-equipped with the latest K version of the Do 217. With uprated engines and a redesigned and more streamlined nose section, this variant was about 30 km (19 mph) faster than the E model it replaced.

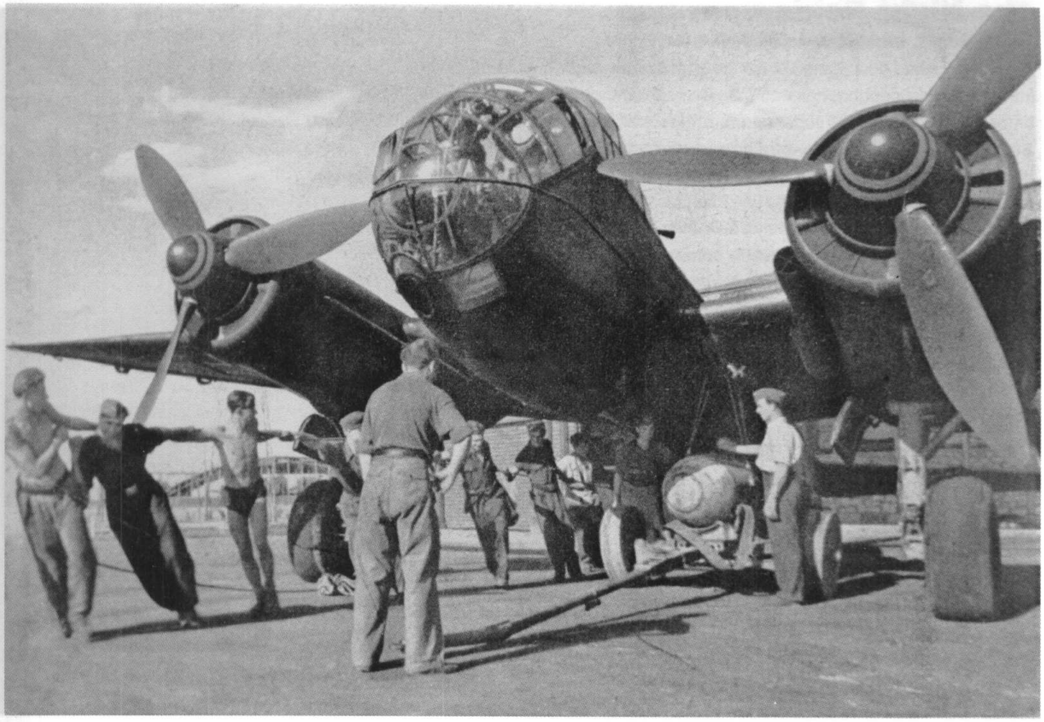
KG 6 operated the latest A-14 version of the Junkers Ju 88, which carried additional armour protection for the crew and other improvements to enhance its combat capability.

An indirect effect of the German attacks on Great Britain in 1942

Although the German air attacks on Britain during 1942 caused relatively little damage and few casualties, in one respect they were extremely successful. The *Luftwaffe* employed only about 200 conventional bombers and a few fighter-bombers in this campaign. Yet throughout 1942 these tied down more than 1,400 British fighters including the latest types, the Mark IX Spitfire and the Typhoon. This was at a time when even a quarter of that number might have had a decisive impact on events in the Middle East or the Far East. The diversion of effort did not end there. There were some 2,000 medium and heavy anti-aircraft guns, and about double that number of lighter weapons, deployed around the country. Also a large scientific and production effort was devoted to developing and building new types of radar to defeat the night bomber. The *Luftwaffe* attacks during this phase of the campaign should not be judged merely on their physical effect, which was low, but also on the constraints they imposed on their enemy's actions.



LEFT: Dornier 217 E-2s of 5./KG 2 camouflaged for night operations in flight over France in the summer of 1942, with the machine coded U5+KN to centre. The aircraft wear a standard 72/73/65 scheme with temporary black undersurfaces. KG 2 operated with II./KG 40 during the so-called 'Baedeker' attacks on Britain in the spring of 1942.



LEFT: A flight of Ju 52/3ms of the Spanish Nationalist Air Force. These aircraft could be distinguished by the white diagonal cross painted over the black circle on the fuselage, most Condor Legion aircraft having plain black discs in this position.

Thus revitalised, the night bomber force began the new campaign on the night of 17/18 January with 118 bomber sorties flown against London – it was the first large-scale attack on the capital since May 1941. The attack was delivered in two waves, with most crews flying double sorties, and the targets were the Millwall and Woolwich dock areas. Defending night fighters shot down four raiders, and a fifth fell to an RAF intruder over France. The raiders caused sporadic damage around the target and started nearly 60 fires, all of which were extinguished before they reached major proportions. The only serious incident occurred at Greenwich, where a power station was badly damaged.

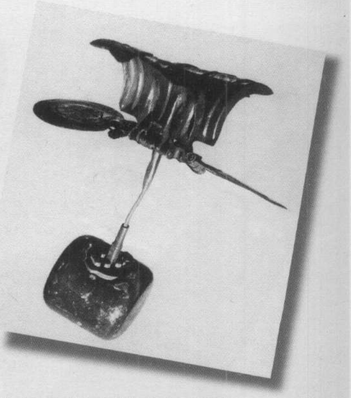
February was a quiet month, with small-scale raids on Plymouth and Swansea.

In March 1943 *Oberst* Dietrich Peltz was appointed *Angriffsführer England*, to direct the air war against Britain. Peltz had made his name as a dive-bombing expert earlier in the war and at the end of 1942 he was appointed Inspector of Bombers. An energetic leader, Peltz worked hard to improve the effectiveness of the bomber arm in the West. Yet, in the absence of stronger forces, better equipment and better-trained crews, there was little he could do. Of the attacks on England he has told the author:

"It was a question of duty. The British and the Americans were destroying German cities one after another and the German people looked to the *Luftwaffe* to strike back. We in the bomber force had our orders, and we had to do the best we could with the limited resources available. What alternative was there?"

LEFT: During the campaigns in Poland and in the West in 1940 Oblt. Dietrich Peltz commanded 1./St.G. 76 equipped with Junkers Ju 87 dive-bombers. In October 1940,he was awarded the Ritterkreuz in recognition of his successful operations over Poland. In the Battle of Britain he flew Junkers Ju 88s with the Stab Kampfgeschwader 77 and in the spring of 1941 he was appointed Gruppenkommandeur of II./KG 77. In September 1942, he took command of I. Gruppe of Kampfgeschwader 60, a Ju 88 unit active over the Mediterranean. In the following December he was appointed Inspector of Bomber Units. In March 1943 he took command of air operations against Great Britain with the rank of Oberst and the title Angriffsführer England, by which time he had received the Eichenlaube to the Ritterkreuz with Schwerten following in July of that year.

When the Butterfly Bombs hit Grimsby



An SD-2 pictured in the open, live, condition in which it fell to earth slowed by the rotating 'wings'. For a time this weapon caused severe disruption to the lives of the citizens of Grimsby, following the Luftwaffe attack on the night of 13/14 June 1943.

An unusual feature of the attack on Grimsby on 13 June 1943 was the release of large numbers of the 2 kg (4.4 lb) SD-2 anti-personnel bombs (known in Britain as 'Butterfly bombs'). These small cylindrical weapons, 7.62 cm (3 ins) in diameter and 7.62 cm (3 ins) long, were carried in the aircraft in special bomb containers of various sizes; in the case of the Grimsby raid, they were housed in AB 23 containers each of which held 23 of the small bombs.

At a predetermined altitude the containers broke open and scattered the small bombs over a wide area. Once clear of their containers, the SD-2's casings opened to form a pair of 'wings' and the individual bombs spun earthwards like sycamore seeds. The SD-2 could be set to explode on impact, after a delay of up to half an hour, or if it was disturbed. The last of those fuses was extremely sensitive, and was intended to enhance the nuisance value of the weapon. The raid on Grimsby resulted in 163 casualties, most of which occurred after the 'all-clear' sounded. When people emerged from their shelters and were returning home, they found the (to them) novel objects and several picked them up to examine them.

From the bomb disposal point of view, dealing with these weapons was difficult. Once it had been made 'live' by the rotation of the 'wings' through a number of turns, there was no means of rendering the SD-2 'safe'. The only means of disposal was by means of a controlled explosion. But if one of these weapons exploded, it was likely to cause the sympathetic detonation of other bombs within a radius of up to 54.86 m (60 yards).

The official report on the raid described several incidents where people picked up unexploded SD-2s (referred to as APBs, anti-personnel bombs) or otherwise interfered with them. Some of these stories would have been amusing, were it not for the tragic or near tragic results:

"A boy picked up an APB in a garden at Cleethorpes one week after the raid and having carried it nearly a mile through crowded streets, handed it to the warden. The warden hastily placed the APB in a lavatory at the back of the post and left immediately. A few seconds later the APB exploded without injuring anyone.

"The caretaker of a school saw a bomb inside the school and went for wardens. When he returned with three wardens, the bomb exploded and all four were killed.

"An APB came through the roof of a house and hung down from the ceiling. Two women were sleeping in the room, one of whom seized it with her hand. It exploded and both were killed.

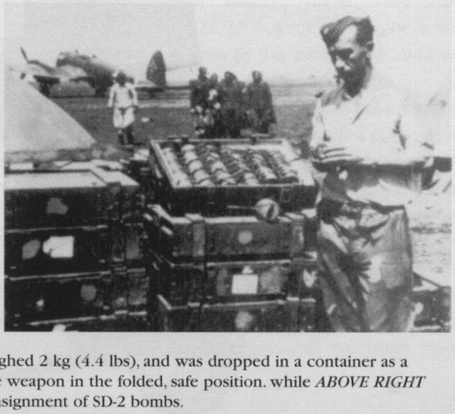
"K M, aged 12, got off bicycle, picked up an APB and threw it out in front of himself. It did not explode so he tried again; this time it exploded approximately 6 yards away; he was only slightly injured.

"Mr C had collected three bombs and, having been advised to put them in the water butt, he started to do so, only to find that the butt was covered with wire netting. He tried to hand one to a companion who refused to take it. He then dropped it and it exploded, killing both men. The other two bombs, which he had put down by the shelter door, then exploded killing two others.

"Mrs F found an APB half buried in the garden of a house on the day following the raid. She picked it up but was admonished by her daughter who took it from her. While she was still holding it, a soldier in a nearby garden shouted to her to drop it, which she did. The bomb exploded but both ladies suffered only slight injuries.

"Some days after the dangers of APBs had been widely publicised, a special constable carried an APB into his inspector's office as he thought the inspector would be interested in it. The bomb was removed rapidly to a safer place where it exploded soon after, without injuring anyone.

"Many more similar incidents occurred, such as children taking bombs home and being told to put them back where they found them. In the circumstances it is remarkable that the APB casualties were not higher."

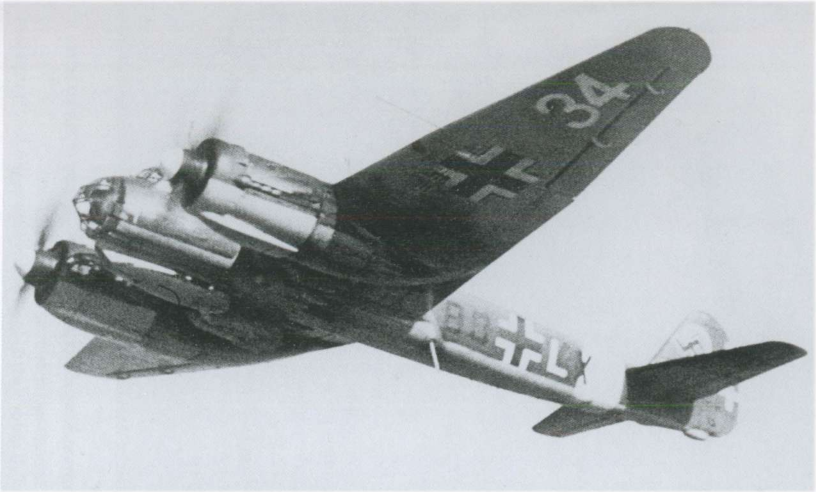


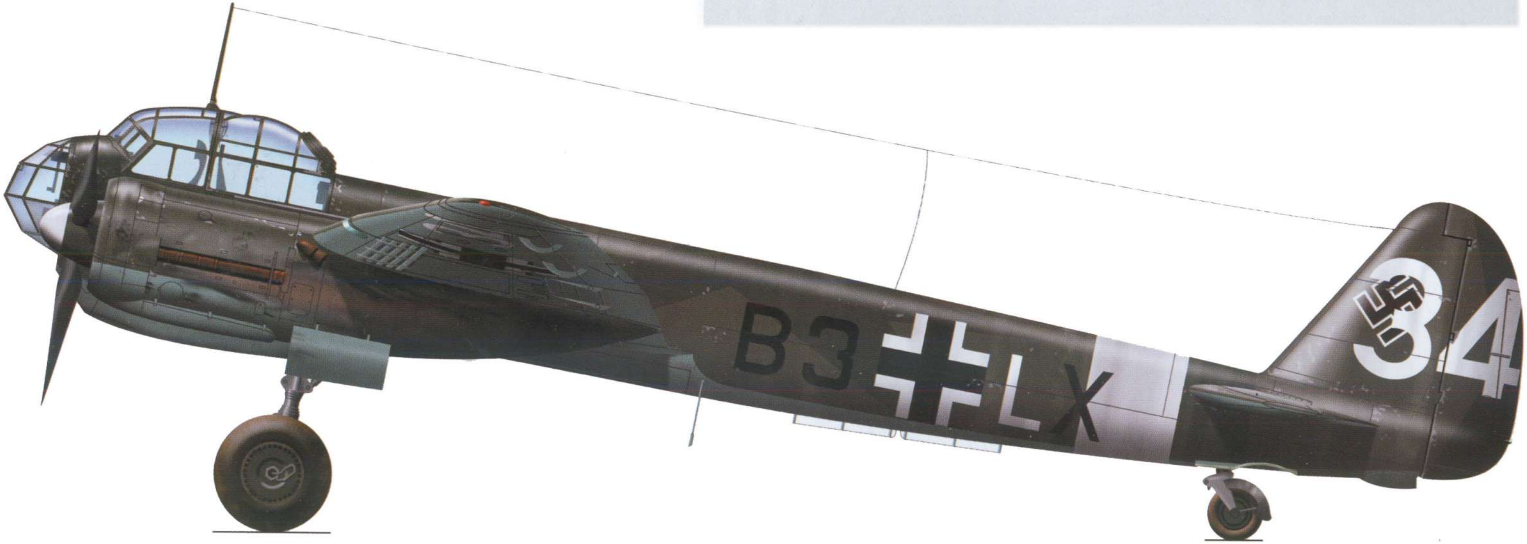
ABOVE: The SD-2 anti-personnel bomb weighed 2 kg (4.4 lbs), and was dropped in a container as a cluster munition. The photograph shows the weapon in the folded, safe position. while *ABOVE RIGHT* An armourer inspects a newly delivered consignment of SD-2 bombs.

Following the attack there was a huge nationwide poster campaign to inform people of the dangers of touching or otherwise interfering with an SD-2, or any unrecognised object that might have been dropped by the enemy.

The search for the SD-2 weapons in and around Grimsby occupied some 10,000 working hours and brought movement to a halt until areas could be declared safe. During the war the *Luftwaffe* dropped huge numbers of SD-2s, most of them on the Eastern Front. Fortunately for Britain's citizens, after the Grimsby attack few were dropped on their country.

RIGHT: Ju 88 A-4 belonging to the dive-bombing school at Tours in France. The aircraft retains the markings of its previous unit, 13./KG 54. The large white '34' painted under the port wing and on the tail served to identify the crew during exercises dropping concrete practice bombs.





Junkers Ju 88 A-4 of the Stuka Schule based at Tours in France during late 1943
The aircraft still bears the markings of 13.(Erg)/KG 54 to which it had previously belonged with the individual letter 'L' in white. It is painted in the standard bomber camouflage of black green and dark green (RLM 70 and 71) uppersurfaces with pale blue (RLM 65) beneath.

The Direct Effects of Air Attacks on Great Britain during 1943

Although the bombing attacks in 1943 started out being heavier than any of those of the previous year, the lower standard of training of bomber crews coupled with major improvements in the defences resulted in fewer casualties. A total of 2,372 people were killed and 3,450 seriously injured, about a quarter less than in 1942.

Commenting on the *Luftwaffe* attacks on Britain in 1943, Lord Cherwell, Scientific Adviser to Winston Churchill wrote to his boss:

> *The total tonnage dropped was 2,320 (the RAF dropped 136,000 on Germany in 1943 and 2,480 on Berlin last Tuesday).* [This was a reference to the RAF attack on 15 February 1944.]
>
> *There were only 20 raids when more than ten tons were dropped on any one town.*
>
> *No town except London more than 20 miles from the coast received more than ten tons in any one raid.*
>
> *On a rough average the German bombers deployed one sortie every 18 days (ours made one sortie every 6 or 7 days). Also only four-fifths of those crossing the coast bombed. One in 11 of those crossing the coast was destroyed. A German plane on the average dropped one ton of bombs. One ton on the average killed one person. Two members of the German Air Force were lost for every five British killed. For every fire caused by the German Air Force, about 30 resulted from normal human causes.*

One of Peltz's first moves was to push for the formation of a new pathfinder *Gruppe*, the I./*Kampfgeschwader* 66, to mark targets for the rest of the raiding force as *Kampfgruppe* 100 had done in 1940 and 1941. It would be some months before the new unit made its appearance over Britain, however.

On 3 March there was another heavy attack on the capital, this time by 117 bombers of which six were lost. Then came small-scale raids on Southampton, Newcastle and Norwich by raiding forces averaging around 40 aircraft. Despite this low rate of effort, losses were heavy. In the course of these attacks, and minelaying operations off the coast, KG 2 lost more than 20 aircraft and crews that month.

April opened with a heavy attack on Chelmsford by 91 bombers, but the rest of the month was relatively quiet with small-scale attacks on London and Aberdeen.

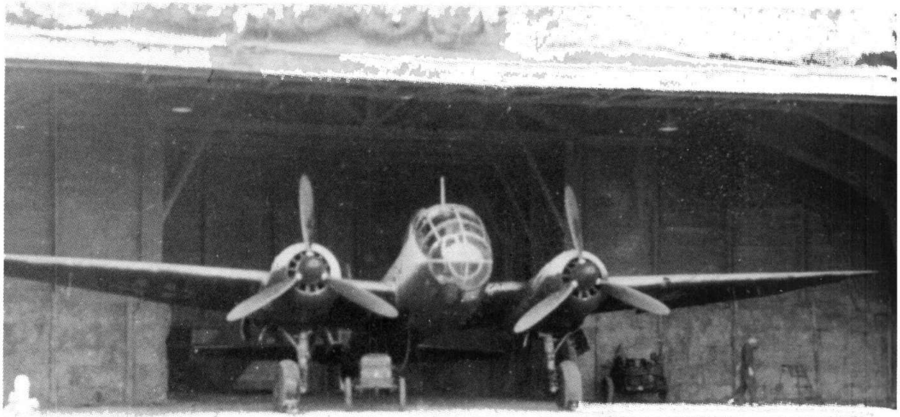
May saw a series of heavy night attacks, in each case by raiding forces exceeding 75 bombers, on Norwich, Cardiff, Chelmsford and Sunderland. In June, Plymouth and Grimsby suffered similar treatment.

Attack on Portsmouth

During July and the first half of August there were further raids on Grimsby, Hull and Plymouth. Then, on the night of 15 August, 91 bombers set out to attack Portsmouth. To observe the pattern of the German assaults by the summer of 1943 and the working of the British defences, we shall examine this action in some detail.

The Dornier Do 217s of I. and III./KG 2, which formed part of the raiding force, took off from their bases at St André and Dreux near Paris. The bombers crossed the coast at Cap D'Antifer near Le Havre, flying at low altitude to remain below the British radar cover for as long as possible. At a point 40 km (24 miles) due south of Brighton the bombers commenced full-power climbs to take them to 4,500 m (15,000 ft), their briefed bomb-release altitude. The attack was to begin soon after 01.00 hours on the 16th.

First, Pathfinder Junkers Ju 88s and Ju 188s of I./KG 66 marked the target for the rest of the force. The first aircraft over the target, the *Zielfinder* (target finder), ran in at high altitude and released a string of flares to illuminate the target. A few minutes later the *Zielmarkierer*, target marker, dropped incendiary bombs to start fires at the target illuminated by the flares. Two minutes later still a pair of *Beleuchter* (illuminator) aircraft released further flares over the target. Then the main force of bombers would commence their attack.

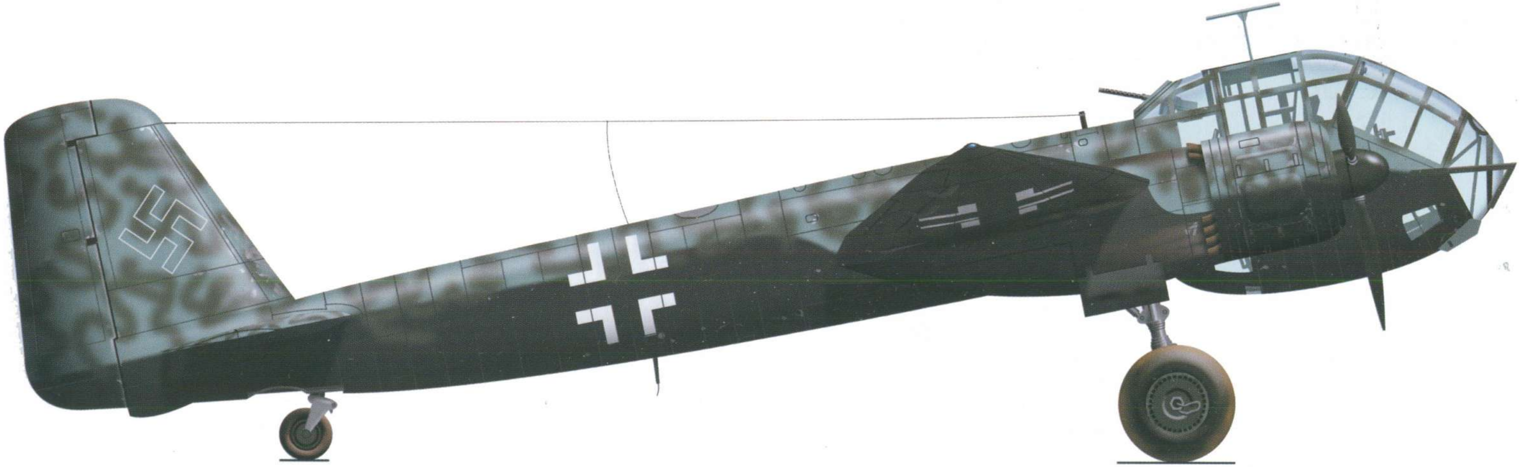


ABOVE: Leutnant Hans Altrogge of I./KG 66 flew Do 217s and later Ju 188s in the Pathfinder role against targets in England.

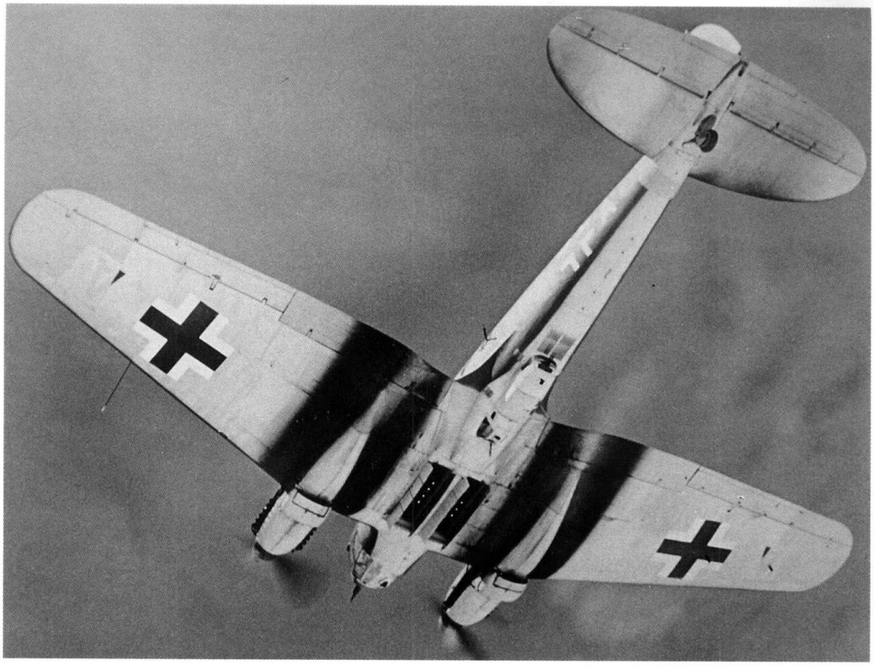
The raid on Portsmouth lasted about an hour, after which the bombers turned to port and returned to France following the route on which they had come in. Defending anti-aircraft batteries claimed to have shot down two raiders and damaged one. Mosquito night fighters claimed three Dorniers. From German records it is known that KG 2 lost four Do 217s over England that night, and a fifth was wrecked when it made a crash-landing at base after suffering battle damage.

On 17 August the *Luftwaffe* sent 88 bombers to attack Lincoln and Grimsby. Harassed by night fighters and guns, this raid was a complete failure and six bombers failed to return. Following these losses the series of raids came to a halt. September 1943 was one of the quietest months since the air attacks on Britain began, with only five people killed and 11 injured.

ABOVE, LEFT, AND OPPOSITE: A Junkers Ju 188s of the pathfinder unit I./KG 66, which marked targets for the raiders attacking targets in Great Britain from the summer of 1943



Junkers Ju 188 E-1 of 1./KG 66 based at Montdidier in France between June 1943 and March 1944.
This aircraft was flown by Lt. Hans Altrogge and had pale grey uppersurfaces over which a dark green 'scribble' pattern has been applied. I./KG 66 was commanded by Major Hermann Schmidt from its formation in May 1943 until the end of the war.



LEFT: An He 111 of an unidentified unit on its bombing run, with the bomb doors ope The noses of the eight SC 250 bombs, suspende from their tails, a just visible.

The Eastern Front

By the beginning of 1942, nearly half the bomber *Gruppen* assigned to the Eastern Front had returned to Germany to reform, to re-equip and to perform much-needed servicing (see *Kampfflieger* Volume Two). The *Luftwaffe* urgently needed to prepare itself to support the renewed Army thrusts into the Soviet Union when the ground dried out after the spring thaw.

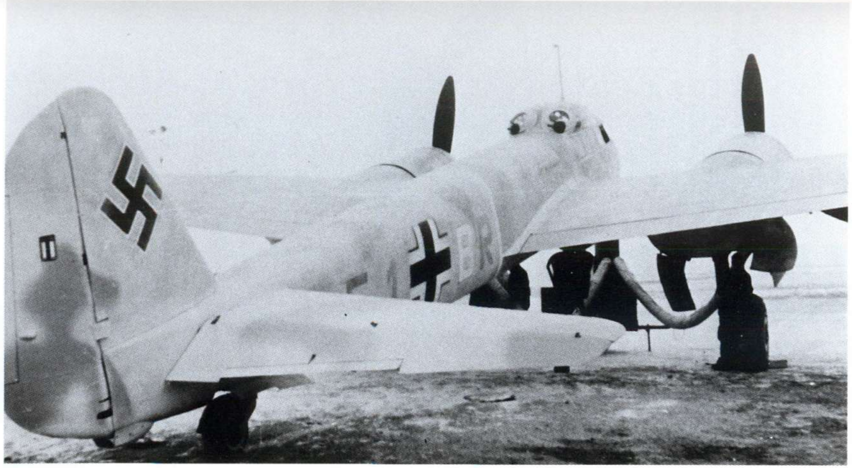
At the beginning of the year most of those bomber units that remained in the East were in poor shape. The effects of the long period of intensive air operations, flying from poorly equipped airfields with inadequate servicing facilities facing supply shortages, seriously affected serviceability.

A more or less typical bomber *Gruppe* at this time, the III./KG 53 with an establishment of 30 He 111s, had lost about half its aircraft during the first six months of the campaign. At the beginning of 1942 it was reduced to about six combat-capable bombers. The unit was based at Schatalowka-Ost near Smolensk, an airfield previously used for the training of Soviet paratroops. By German standards the airfield was ill-equipped, though the unit's personnel were grateful for the stone-built barrack accommodation. For many others having to face their first experience of a Russian winter, things were a lot worse.

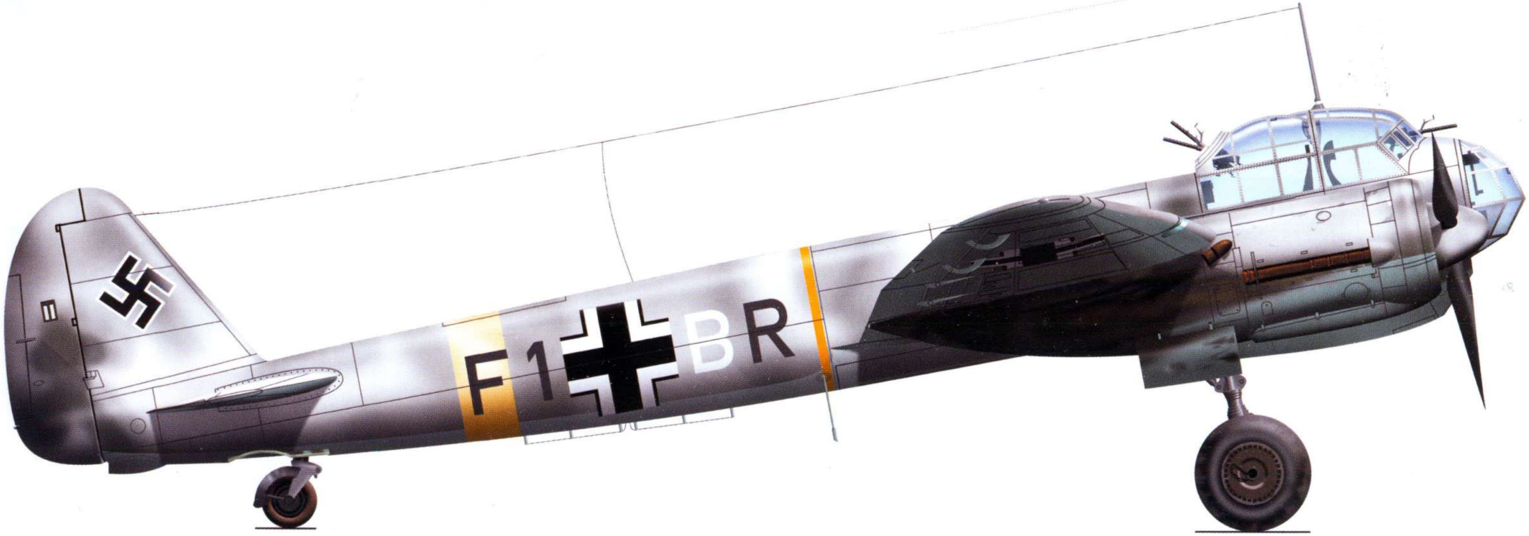
The severe weather conditions on the Eastern Front raised a host of problems, which the *Luftwaffe* had been ill prepared to meet. Its personnel lacked proper cold weather clothing, and there was a general lack of the specialised equipment necessary to maintain aircraft parked in the open during the cold nights. Aero engines, lubricating oil and guns were liable to freeze solid, and all manner of heating devices had to be improvised to thaw them out.

The *Luftwaffe* desperately needed a breathing space to recover from the previous months' exertions. But many units did not get one, for early in December the Soviet Army launched its winter counteroffensive. In the face of attacks by fresh Soviet divisions trained and equipped for winter fighting, the exhausted German troops began to give ground. By the end of February 1942 the German Army succeeded in establishing a new defensive line, albeit one that was critically thin in places.

When the front line finally stabilised, two German strongholds that had been isolated were holding out, one at Demyansk and a smaller one at Kholm. The *Luftwaffe* was given the task of supplying the troops from the air.

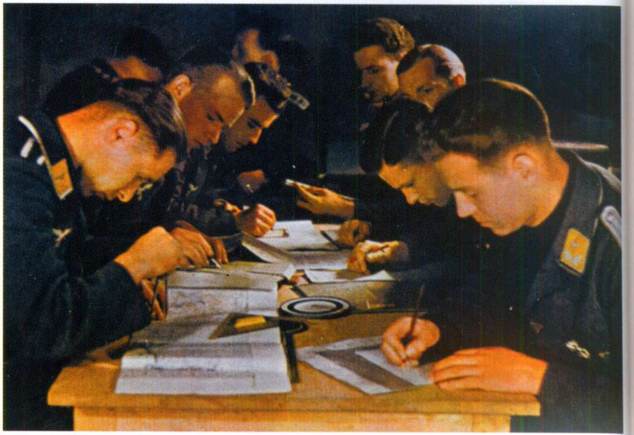


LEFT: A Ju 88 of 7./KG 76 on the Eastern Front in the winter of 1941-1942. The aircraft wears an unusual toned down colour scheme with white paint oversprayed on the standard green camouflage. Seen at the front of the aircraft are the pipes from the combustion heater unit.

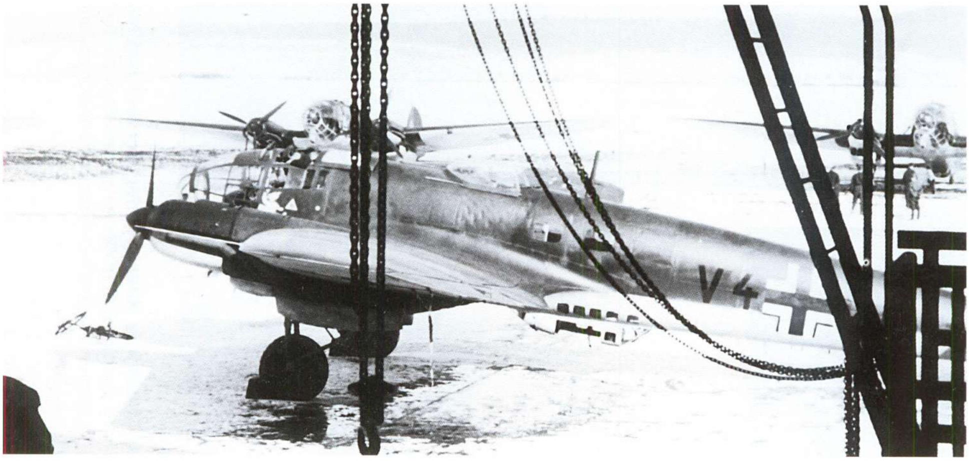


Junkers Ju 88 A-4 of 7./KG 76 based at Armawir in Russia during October and November of 1942
At this time III./KG 76 had temporary white finish applied to its Ju 88s for operations in the Russian winter. Shortly afterwards, however, it moved to Athens-Tatoi to support Rommel's defence of North Africa. The commander of the Gruppe at this time was Hptm. Heinrich Schweikhardt.

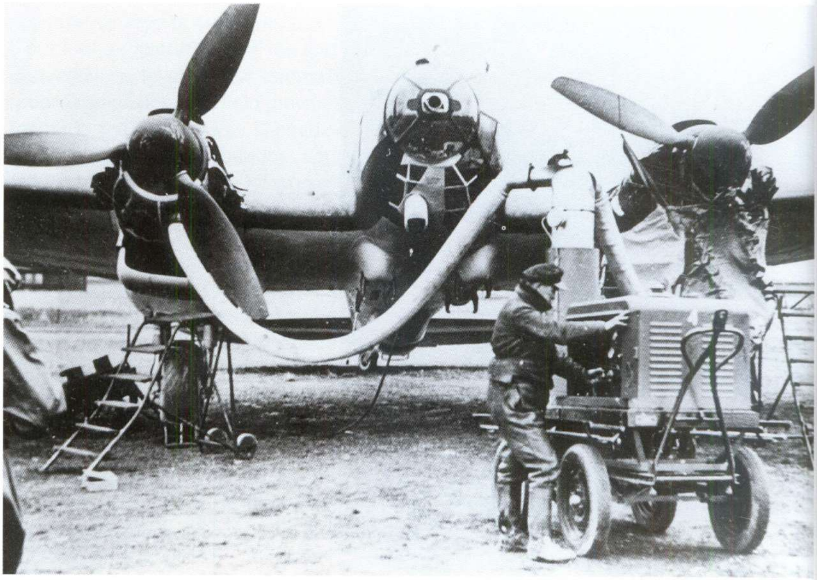
ABOVE: An interior view inside the cabin of a Heinkel He 111. Its crew appear very relaxed!



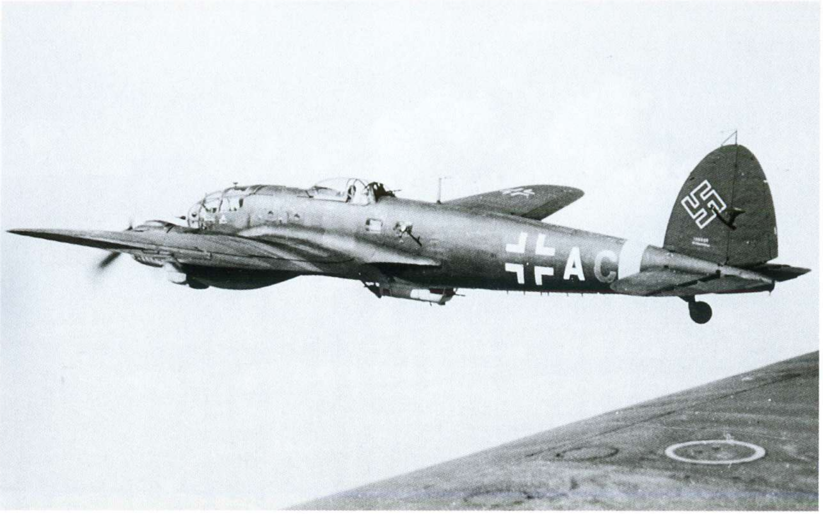
ABOVE: Air crew from a bomber unit go through a flight plan prior to an operational mission.



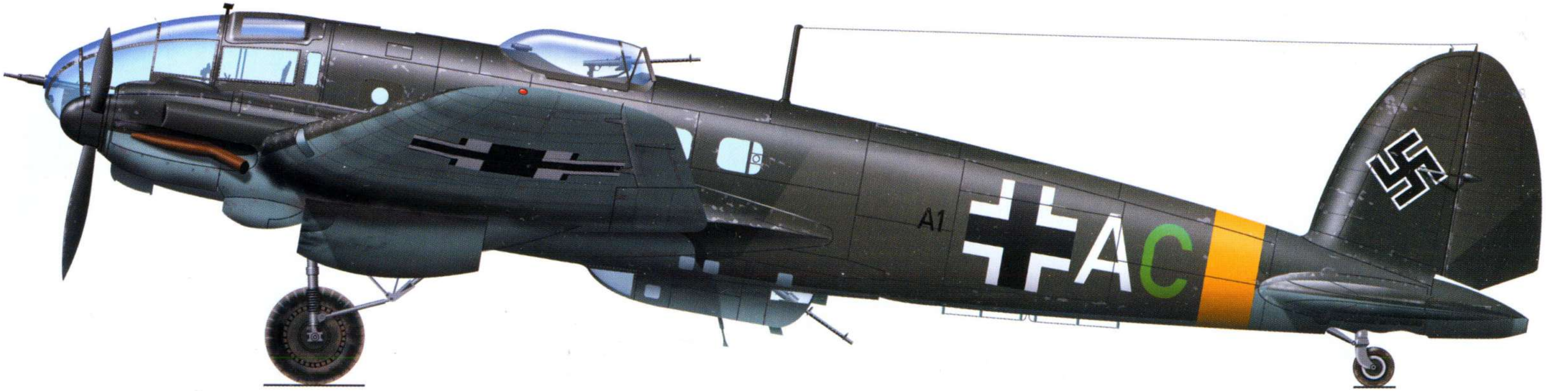
LEFT: A combustion heater used to warm the engines' coolant and lubrication systems of a He 111 before starting the engine. This was a particularly important item of equipment for units operating on the Eastern Front during the winter months.



RIGHT: During the winter of 1941-1942 the bomber Gruppen assigned to the Eastern Front returned to Germany to reform and undergo much needed maintenance. This photograph shows aircraft of KG 1 at the unit's airfield in Germany.



LEFT: A He 111 H-16 of II./KG 53. Just visible protruding from the nose of the aircraft is the 20 mm MG FF cannon carried by these aircraft on the Eastern Front and used mainly for low-altitude ground-strafing missions.



Heinkel He 111 H-16 of the II. Gruppe Stab of KG 53 based at Olsufjewo in southern Russia between July and September 1943

By the middle of 1943 the first two characters of the unit code (in this case 'A1') had been much reduced in size on most Luftwaffe bombers with the individual letter 'A' in white, the Staffel letter 'C' in white. It is possible that this aircraft was allocated to Major Herbert Wittmann, Kommandeur of II./KG 53 from May 1943 to March 1945 when the Gruppe was disbanded.

LEFT: A Gruppe of He 111s head out on a bombing mission somewhere over the Russian Front.

ABOVE: The operation to supply the encircled German troops at Demyansk was commanded between 19 February to 19 May 1942 by Oberst Fritz Morzik, the Officer Commanding Luftwaffe Air Transport.

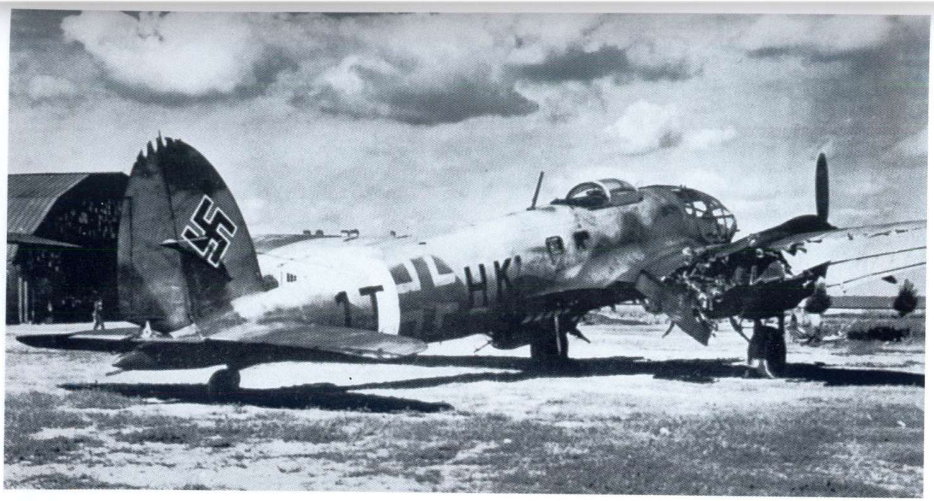
At Demyansk, midway between Moscow and Leningrad, six divisions of the German 16. *Armee* with about 100,000 men had been cut off. An airlift began to carry supplies to the two airfields in the pocket, undertaken mainly by Ju 52 transport machines. By requisitioning these aircraft from every possible source, notably the flying training schools in Germany, the *Luftwaffe* collected nearly 600 aircraft for the airlift. The daily average requirement for the besieged units was 300 tons, and this figure was almost met. What had started off as a temporary expedient developed into a protracted operation, which lasted until the siege was lifted in May 1942.

The force surrounded at Kholm was far smaller than that at Demyansk – there were only about 3,500 men – but the problem facing the *Luftwaffe* was more difficult. There was no usable airfield within the pocket, so supplies had to be dropped by parachute or flown in aboard gliders. As well as transport machines and glider-towing units, the Heinkel 111s of KG 4 were assigned the task of carrying supplies which they air-dropped to the garrison at Kholm. There too, the pocket was finally relieved in May 1942.

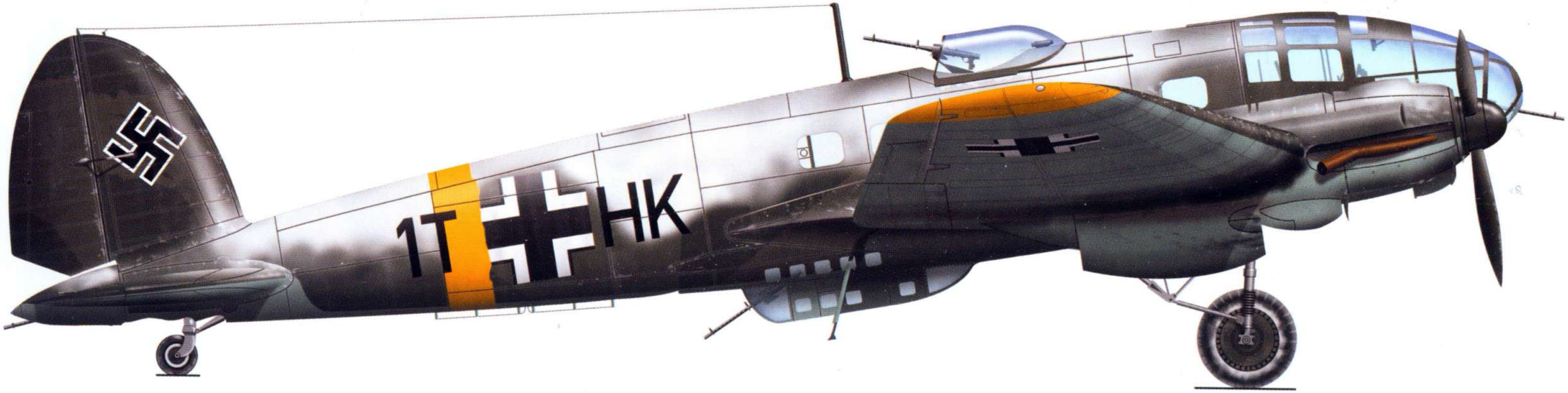
The airlift operations to Demyansk and Kholm were the largest to be undertaken up to that time, and they cost the *Luftwaffe* nearly 300 aircraft excluding gliders. The airlift was successful in holding ground and perhaps saving units which might otherwise have been lost. But, as we shall see, the greatest significance of the operations was that they created a very dangerous precedent for the future.

Early in 1942 the *Luftwaffe* long-range bomber force resumed its attacks on strategic targets, following the pattern established during the previous year. During January there were three small-scale attacks on Moscow. On 6 February bombers raided the aircraft factories at Voronezh and an automobile plant at Gorki presumed to have switched to the manufacture of tanks. In the weeks to follow there were further attacks on Voronezh and Gorki, on the aero engine plant at Rybinsk, on the oil refinery at Kalinin and several raids on Moscow. In June the campaign came to an end, as the long-range bomber force reverted to attacking tactical targets in close support of the army.

During 1942 Adolf Hitler planned to consolidate the German positions around Leningrad, while concentrating his main strength on the southern part of the Front to seize important oilfields in the



LEFT: When they were unable to bring down German aircraft by conventional means, Soviet pilots often resorted to ramming attacks. This He 111 of KG 28, previously Kampfgruppe 126, coded 1T+KH, was lucky to regain its base after a Soviet fighter had rammed it. Note the propeller slashes at the top of the fin, and the major damage inflicted at the starboard wing root.



Heinkel He 111 H-4 of 8./KG 26 based at Sestschinskaja in Russia early in 1942
This unit had been formed from 2./KG 28 on 15 December 1941 but retained the code of the former unit. It has temporary white finish sprayed over its dark green uppersurfaces for operations during the Russian winter. The yellow rear fuselage band and wingtips were carried by most Luftwaffe aircraft operating in northern and central Russia.

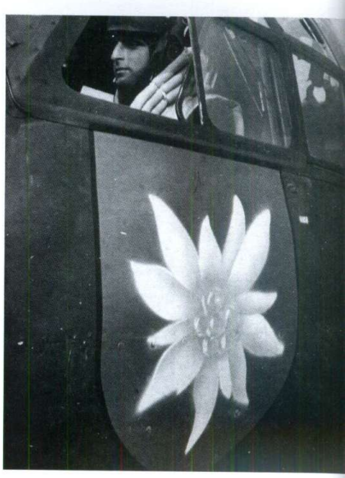
The Pattern-Bombing Attack

Whenever the *Luftwaffe* possessed sufficient local air superiority to allow its long-range bombers to fly in formation and attack targets by day, it usually delivered pattern-bombing attacks.

Suitable targets for this tactic were those with a large area extent, such as railway marshalling yards, communications centres, and troop and vehicle assembly areas. For a pattern-bombing attack the bomber formation might comprise one, two or three nine-aircraft *Staffeln*. Typically the attack force would fly in one or more 'V' shaped waves each with three, five or seven bombers. During the planning of the attack the spacing between individual aircraft, and the spacings between successive bombs and succeeding waves were calculated to produce the required pattern of bombs on the ground.

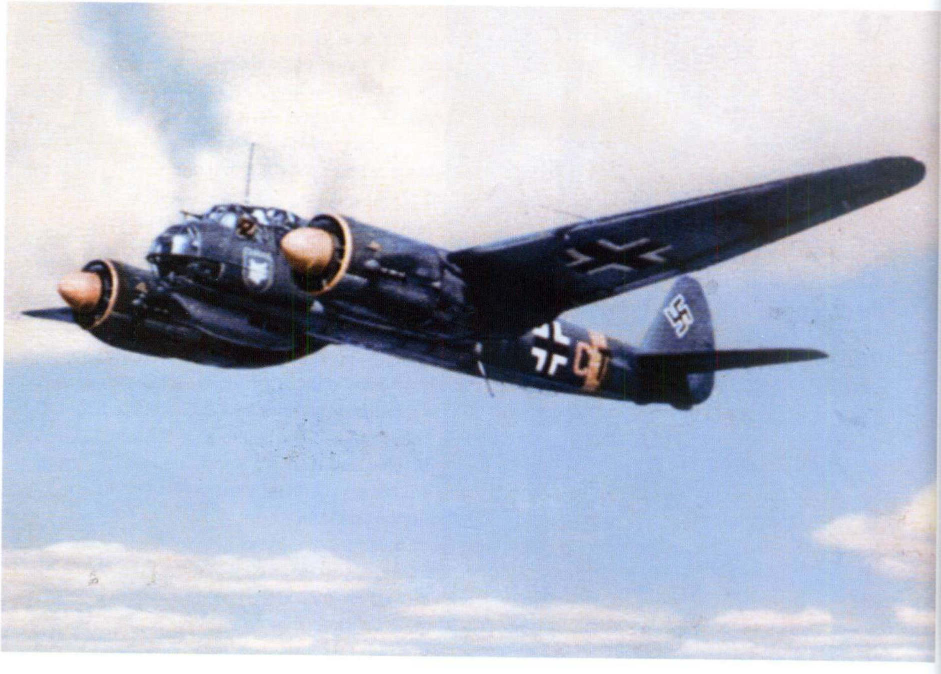
On this type of attack the bomber formation flew at altitudes between 2,000 and 5,000 m (7,000 and 16,000 ft), depending on the strength of the AA defences in the target area. The bomb-aimer in the lead bomber guided his aircraft to the target, and aimed his bombs at the nearest part of the target area. As this machine started to release its bombs, the bombers following it in close formation released theirs. A major advantage of this method was that the pattern of bombs was aimed by the best qualified bomb-aimer in the unit, an important consideration given the uneven levels of training and experience in wartime units. The width of the bomb pattern equalled the width of the formation, typically 50 to 200 m (60 to 220 yards) depending on the lateral spacing between aircraft. The length of the bomb pattern equalled the length of the formation plus the length of bomb stick selected. If such an attack fell accurately upon a concentration of enemy troops or vehicles, the large number of closely spaced detonations within a period of a few seconds caused considerable shock effect.

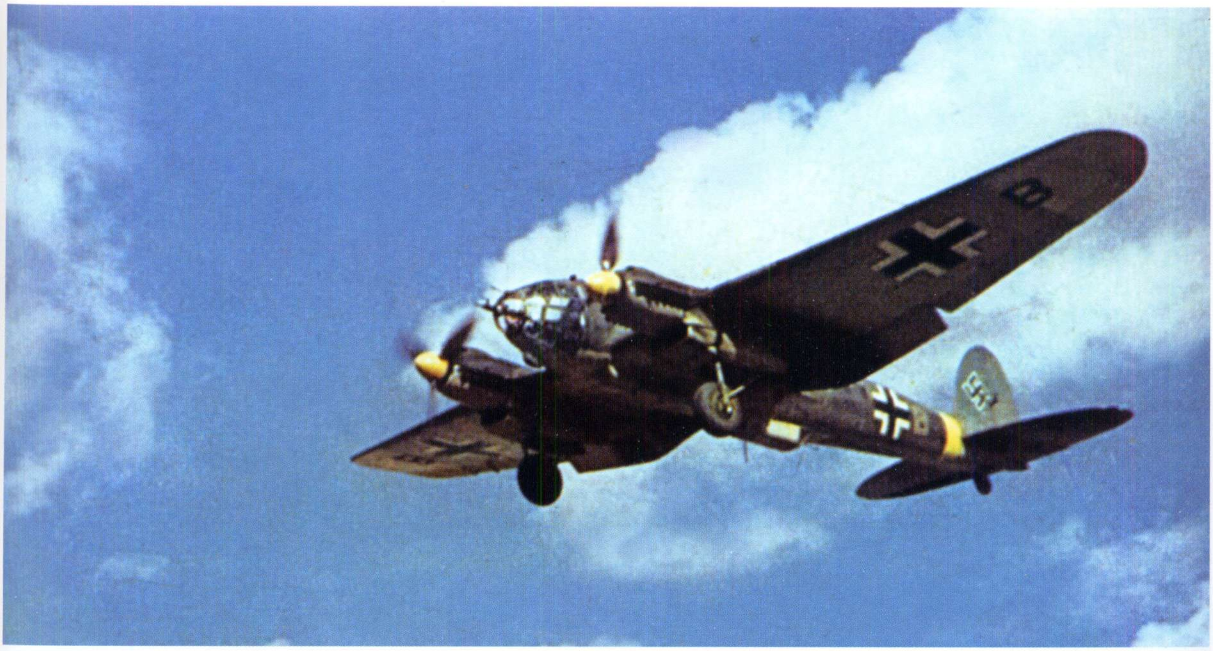
From mid-1942 the strength of Allied fighter opposition precluded pattern-bombing attacks in the West and the Mediterranean areas of operations. During the period under review they continued to be used on the Eastern Front, however.



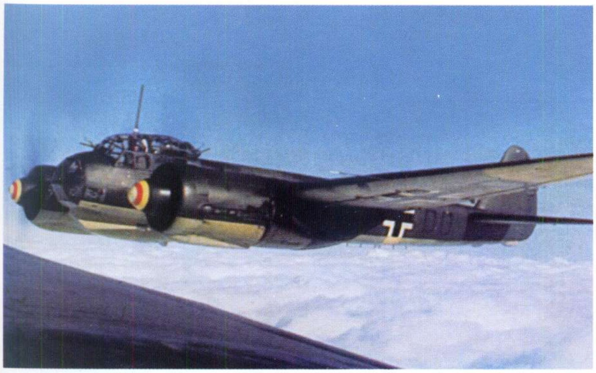
ABOVE: The Edelweiss flower Geschwader emblem of KG 51.

RIGHT: This photograph from a wartime postcard, shows a Ju 88 of 9./KG 51 with yellow spinners and fuselage band which identify it as an aircraft operating on the Eastern Front.





ABOVE: An He 111 H-16 of 8./KG 53 coded A1+BS coming in to land, summer 1942. The aircraft carries a yellow fuselage band which identifies it as operating on the Eastern front. The underside of wing tips and spinners are also painted yellow. The individual aircraft letter 'B' is painted in black on the yellow part of the wing tips.



ABOVE: A Ju 88 A-4, coded F1+DD of Stab III./KG 76. The spinnner tips have been painted in the three colours of white, red and yellow, representing each of the Staffel colours of the Gruppe.

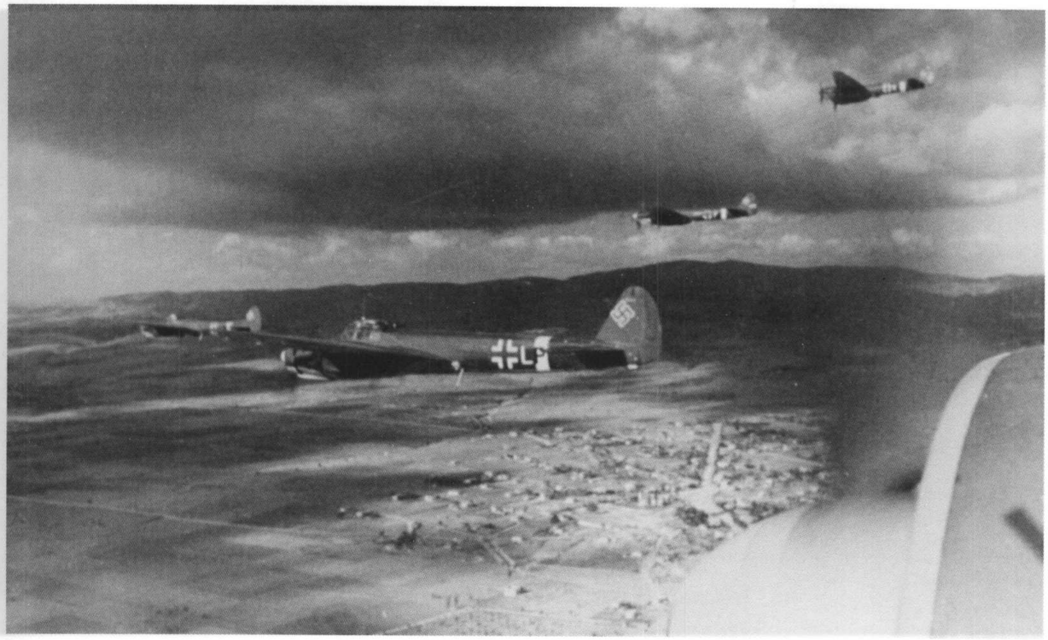
Caucasus area. But first the southern flank of that thrust had to be secured, which meant occupying the Crimea and in particular the strong Russian fortress of Sevastopol. Accordingly, in May 1942, *Luftwaffe* units began to concentrate in southern Russia ready to support the offensive.

Luftflotte 4, supporting the operation, possessed six *Gruppen* of He 111s and Ju 88s, drawn from KG 51, KG 76 and KG 100. At the same time several tactical airfields in the area were made ready, and were stocked with supplies and munitions to enable them to operate at high sortie rates.

While *Luftwaffe* fighters maintained air supremacy over the area, German ground forces with powerful air support advanced rapidly into the Crimea. Their main objective was the fortress city and naval base at Sevastopol, which they invested on its landward side. The assault on that city began on 2 June and the commander of the VIII. *Fliegerkorps, Generaloberst* Wolfram *Freiherr* von Richthofen (a cousin of the World War I fighter ace) believed he could best support the Army's attacks by breaking the morale of the Russian defenders. To that end he ordered his units to keep the Soviet positions under extreme pressure from the air, while German artillery pounded them with a heavy bombardment. Once the port's anti-aircraft defences had been destroyed, *Luftwaffe* bombers and dive-bombers had free rein to attack targets at will.

During this offensive the *Luftwaffe* attacks were not confined to the fortress area. Soviet airfields in the west Caucasus and the Black Sea ports were also bombed, to destroy any forces that might attempt to aid the Soviet defenders. The battle for Sevastopol continued until 4 July, when the last of the Soviet resistance finally ended.

The next phase of the German offensive began on 28 June, when the advance to the Caucasus got under way. During this phase the bomber units continued to strike at tactical targets ahead of the army. Almost a month later, on 27 July, Ju 88s of KG 51 delivered the first attacks on a city on the Volga River that lay in the path of the German advance. It was named Stalingrad.

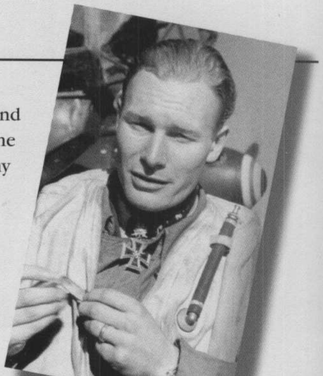


LEFT: A flight of Junkers 88s of K./KG 51 on their way to the target. Some aircraft from this unit carried a yellow ring to the front of the engine cowling.

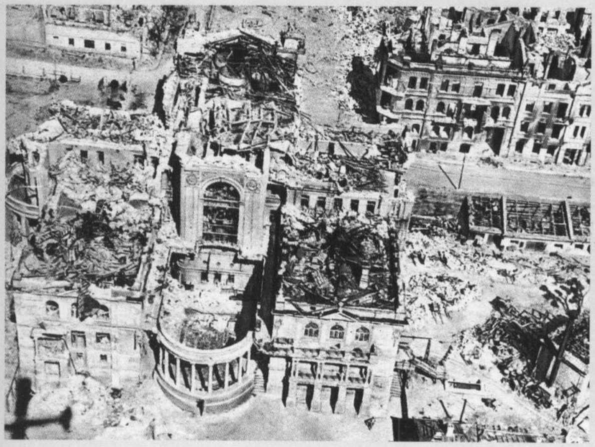
The Ferocity of the Attack on Sevastopol

The sheer pace of the *Luftwaffe* air operations against Sevastopol made extreme demands on the men and machines involved. *Major* Werner Baumbach, the *Geschwader Kommodore* of KG 30, flew on some of the attacking aircraft to see for himself the conditions in the area. He later wrote in his autobiography (published in English as *Broken Swastika*):

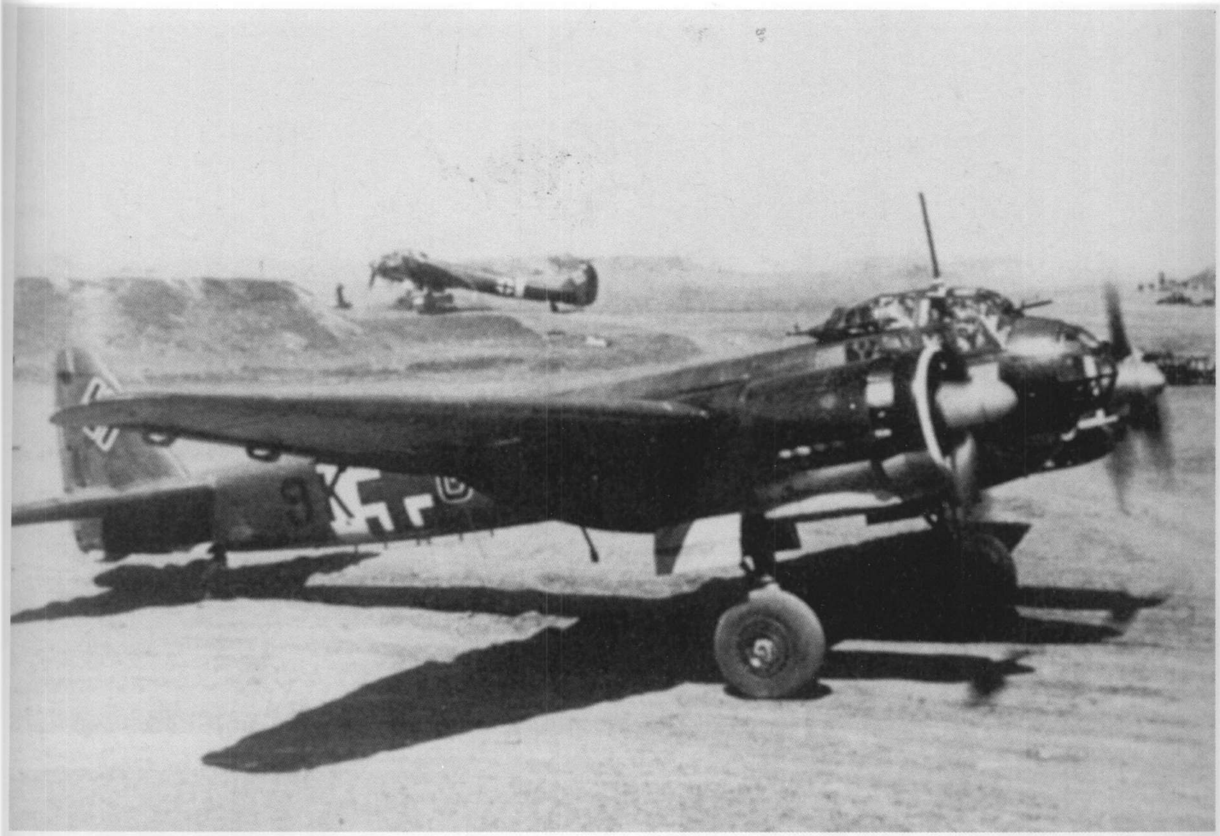
> *"From the air Sevastopol looked like a painter's battle panorama. In the early morning the sky swarmed with aircraft hurrying to unload their bombs on the town. Thousands of bombs - more than 2,400 tons of high explosive and 23,000 incendiaries - were dropped on the town and fortress. A single sortie took no more than twenty minutes. By the time you had gained the necessary altitude you were in the target area... the Russian AA was silenced in the first few days so the danger to aircraft was less than in attacks on the Caucasus harbours or Russian airfields. Yet our work at Sevastopol made the highest demands on men and material. Twelve, fourteen and even up to eighteen sorties were made daily by individual crews. A Ju 88 with fuel tanks full made three or four sorties without the crew stretching their legs."*

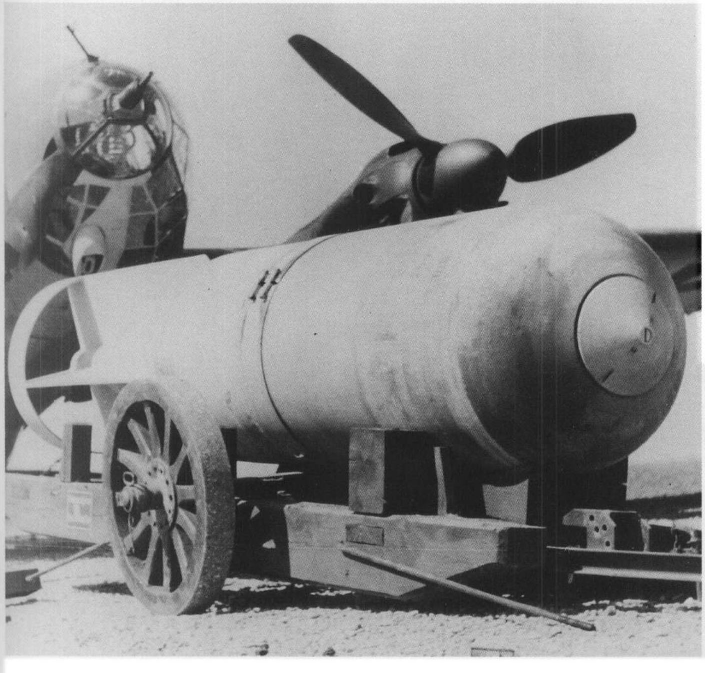


ABOVE: Major Werner Baumbach, the Geschwader Kommodore of KG 30.



LEFT: A scene of utter carnage at the Crimean town of Sevastopol in July 1942 as inflicted by the bombers of General Wolfram Frhr. von Richthofen's VIII. Fliegerkorps.

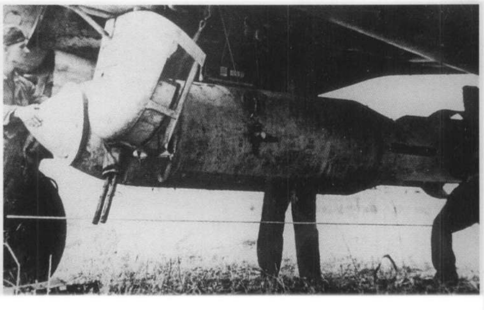


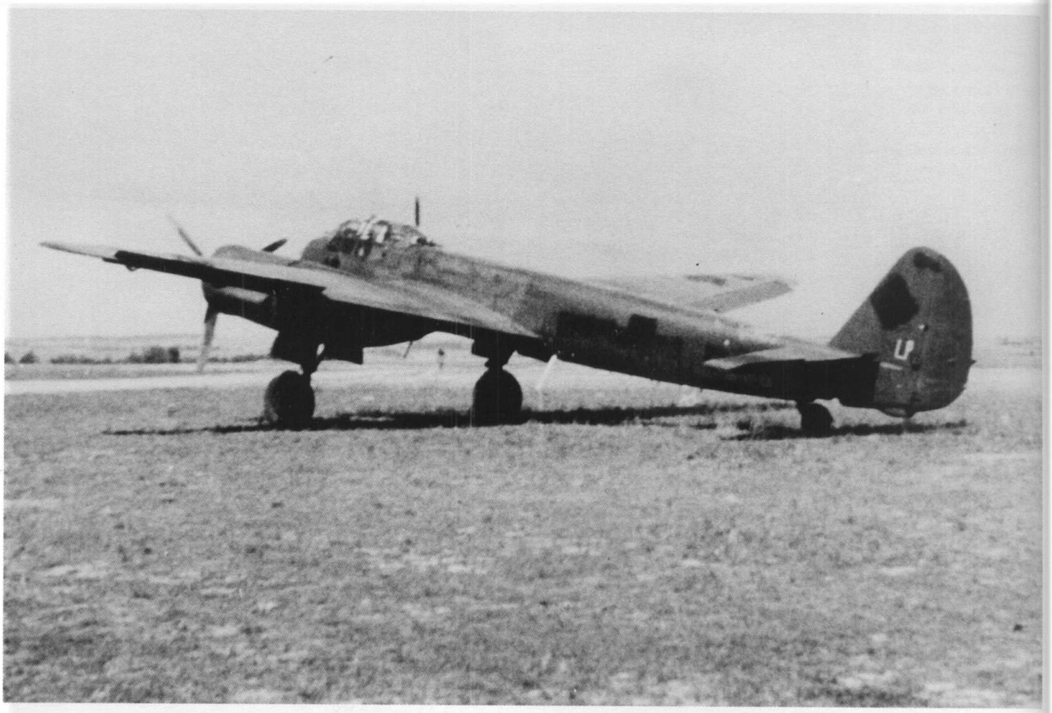


ABOVE: A Ju 88 A-4 of KG 51 possibly of 6. Staffel, prepares for take-off. The aircraft carries the yellow Eastern Front fuselage theatre identification band and yellow spinners. The other distinguishing marking was the thin yellow band around the front of the engine cowling.

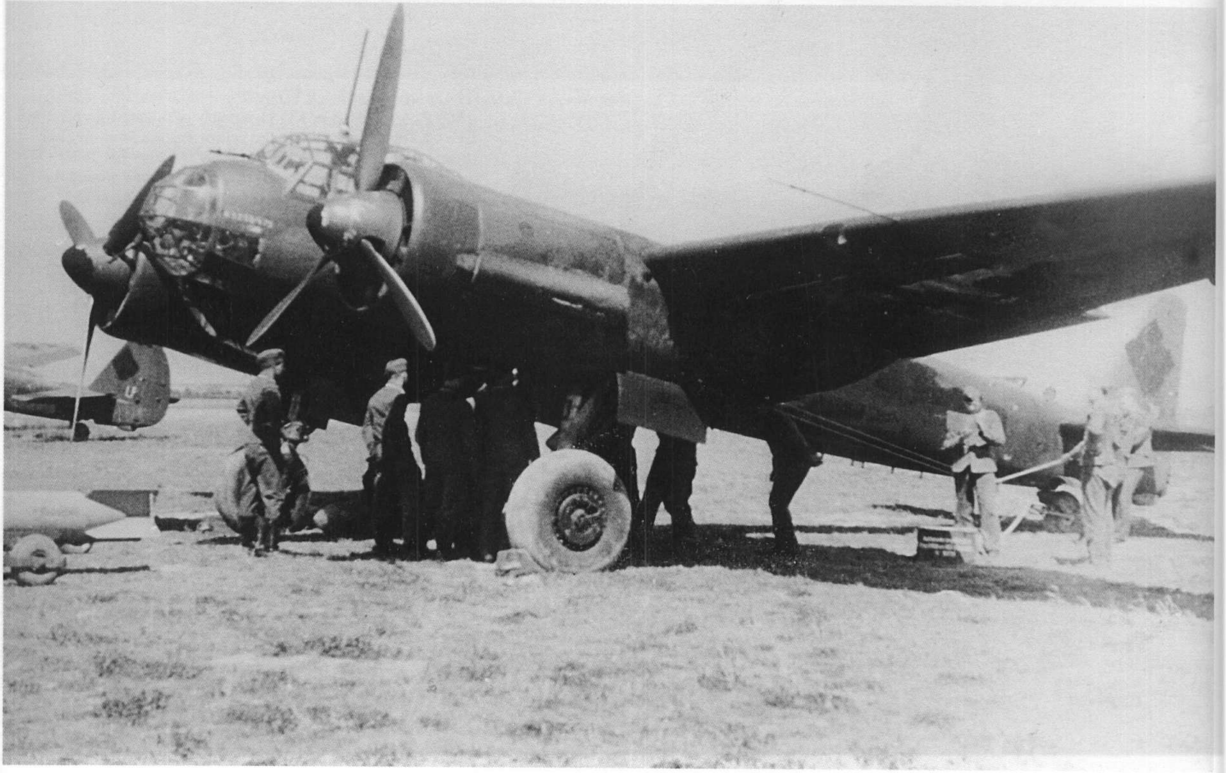
LEFT: A He 111 about to be loaded with the SC 3500 'Max' (5,500 lbs), the heaviest type of bomb in front line use by the Luftwaffe.

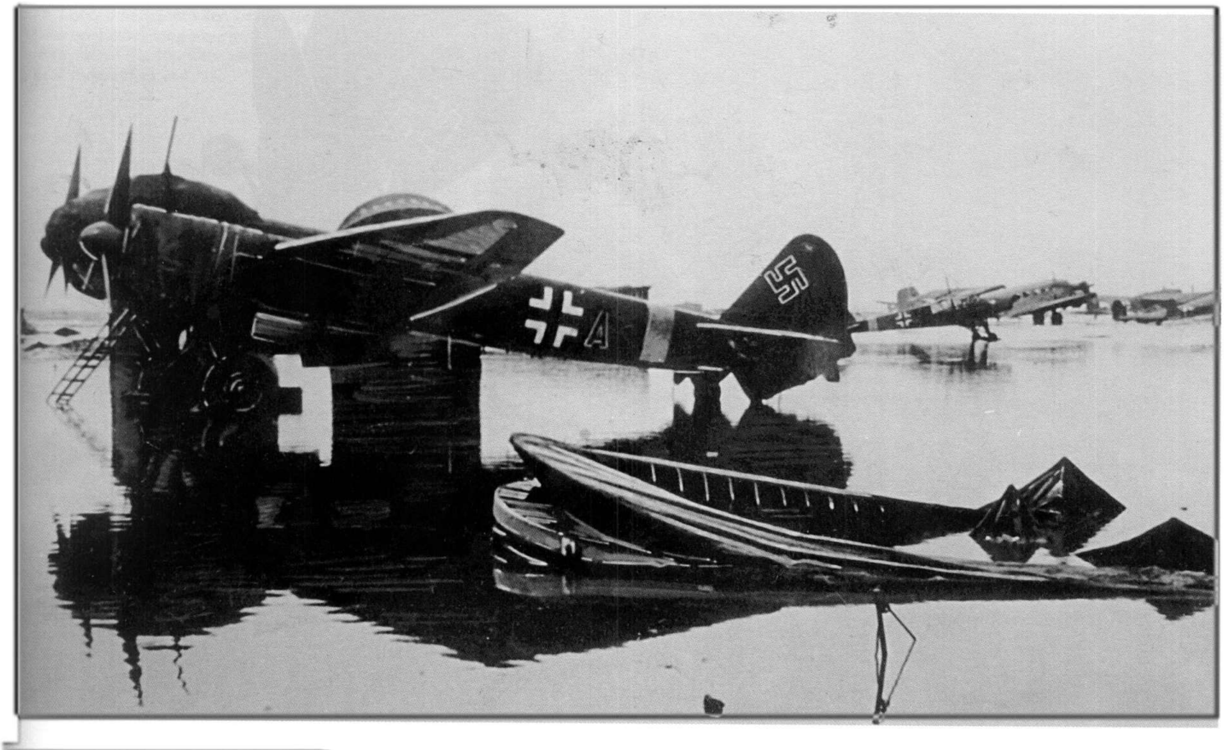
BELOW: Armourers loading an SC 1800 'Satan' (3,970 lbs) on to the fuselage rack of a Ju 88 of KG 51.





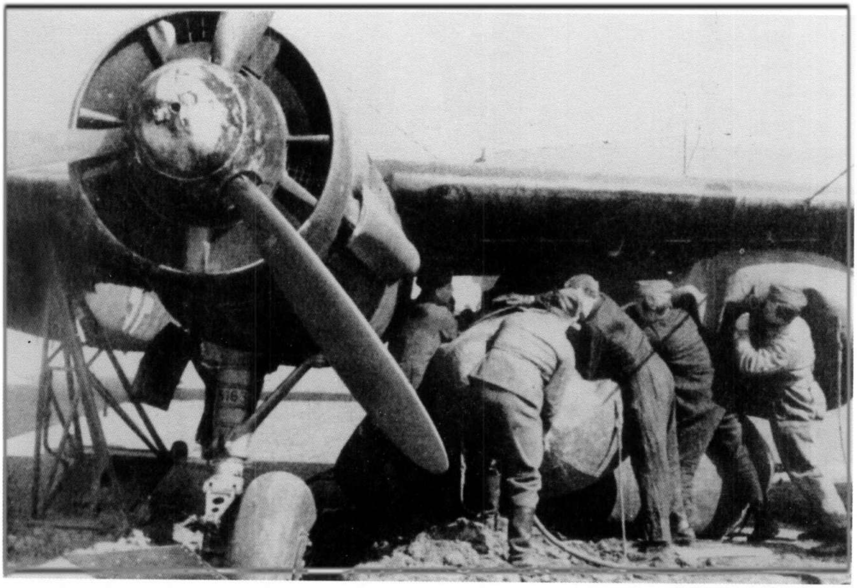
RIGHT AND BELOW: Junkers Ju 88 A-4s of 7./KG 3 pictured during operations on the Eastern Front. Note the roughly daubed black paint covering the national markings on the wings, fuselage and tail intended to render the aircraft less conspicuous during night operations.





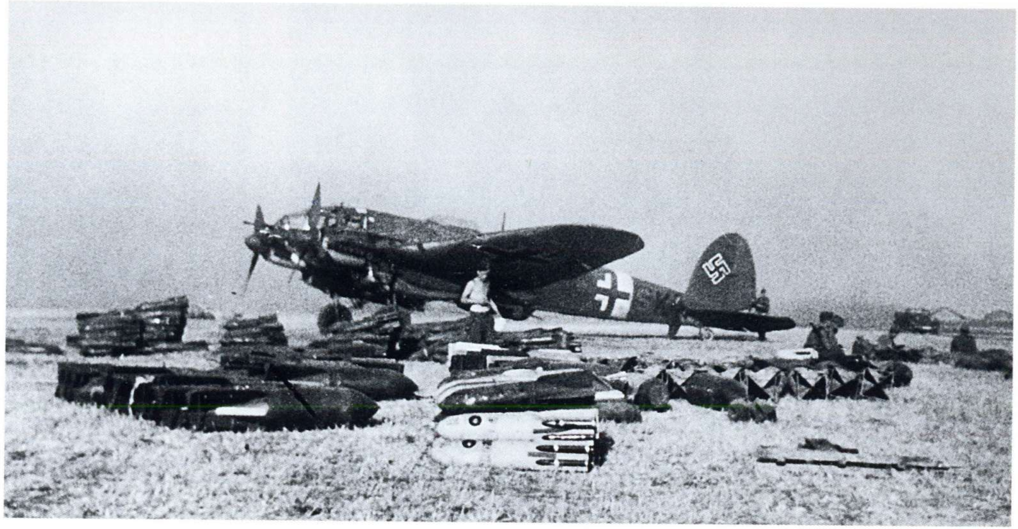
ABOVE: After each winter in Russia came the spring thaw, a period which imposed a whole new set of difficulties for those units attempting to conduct air operations in that theatre.

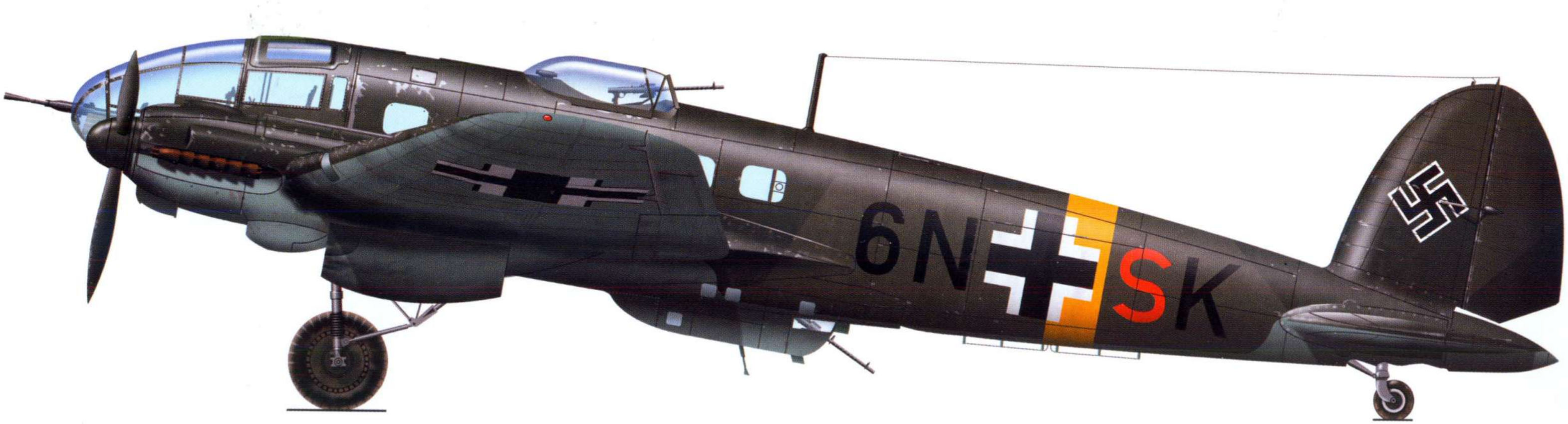
ABOVE: Oberleutnant Horst Rudat commanded 2./KG 55 on the Eastern Front. He received the Ritterkreuz in March 1943, after several successful attacks on bridges and trains. He took part in the Stalingrad airlift, and during one noteworthy mission in January 1943 he returned with 27 wounded soldiers aboard his He 111. Later in the war he flew some of the first operational missions with the Mistel composite on the Western Front.



ABOVE: Even when the thaw ended, many airfields retained patches of soft ground where aircraft were liable to become bogged down, as in the case of this Ju 88 which is being 'salvaged' by ground crew.

RIGHT: Heinkel He 111 H-16 coded 6N+SK of 2./KG 100 is loaded with bombs prior to an operation over southern Russia during August and September 1943.

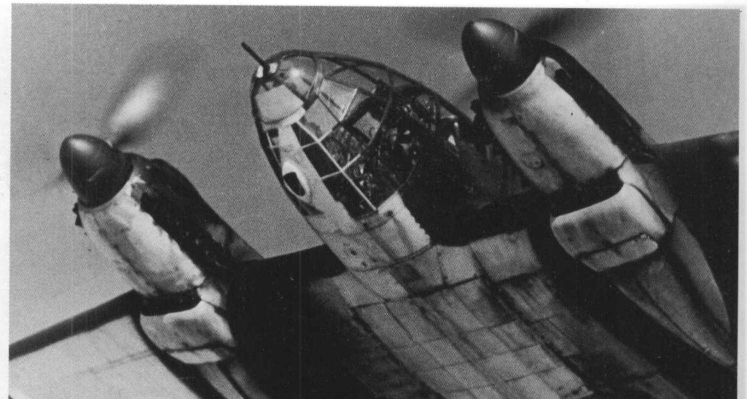


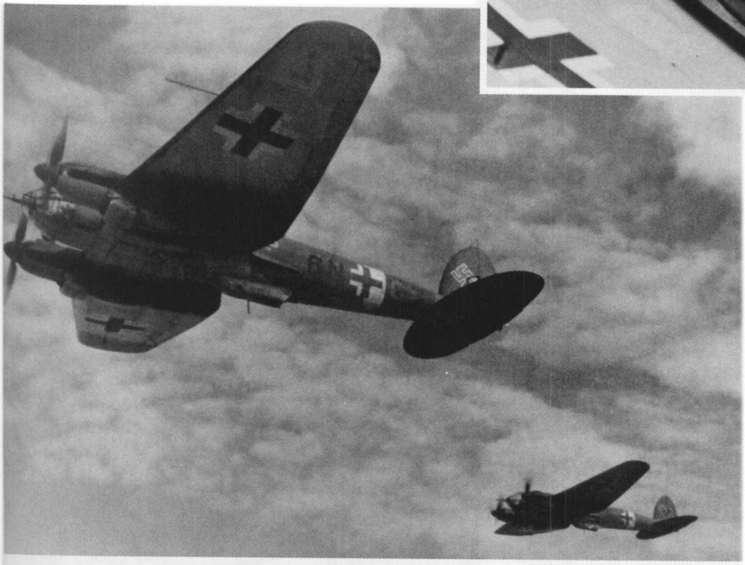


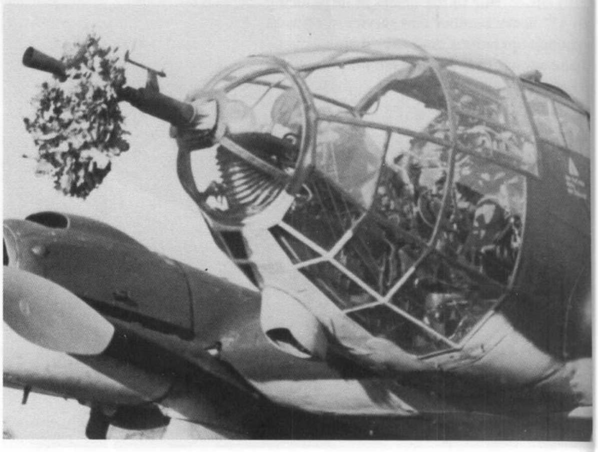
Heinkel He 111 H-16 of 2./KG 100 based at Dnjepropetrovsk in southern Russia during August and September 1943

The individual letter 'S' of the unit code '6N+SK' has been painted in the Staffel colour red with a wide band painted around the fuselage in white. This marking was adopted by Luftwaffe aircraft operating in southern Russia and the Mediterranean theatre.

THIS PAGE: Due to the delays in introducing the Heinkel He 177 heavy bomber into service, the He 111 had to continue operations long after it should have been replaced. These aircraft of KG 100 were photographed in southern Russia in the summer of 1943.







ABOVE: Hans-Georg Bätcher's aircraft suitably decorated on the occasion of his return from his 600th mission. The garland hangs from the barrel of the nose-mounted MG FF 20 mm cannon, with its tapered flash eliminator at the muzzle and external ring-and-bead gunsight.

On 23 August, the 16. Panzer Division reported that it had reached the Volga River near Stalingrad, but it had to fight hard to retain its toehold. On 3 September the large-scale aerial bombardment of Stalingrad began. While the dive bombers and ground-attack aircraft provided close-support for the advancing German troops, He 111s and Ju 88s concentrated their attacks on rail and other supply routes into the city, and Soviet airfields to the east of it. Most Soviet supplies were delivered to the city by night, however, so the attacks were of little avail.

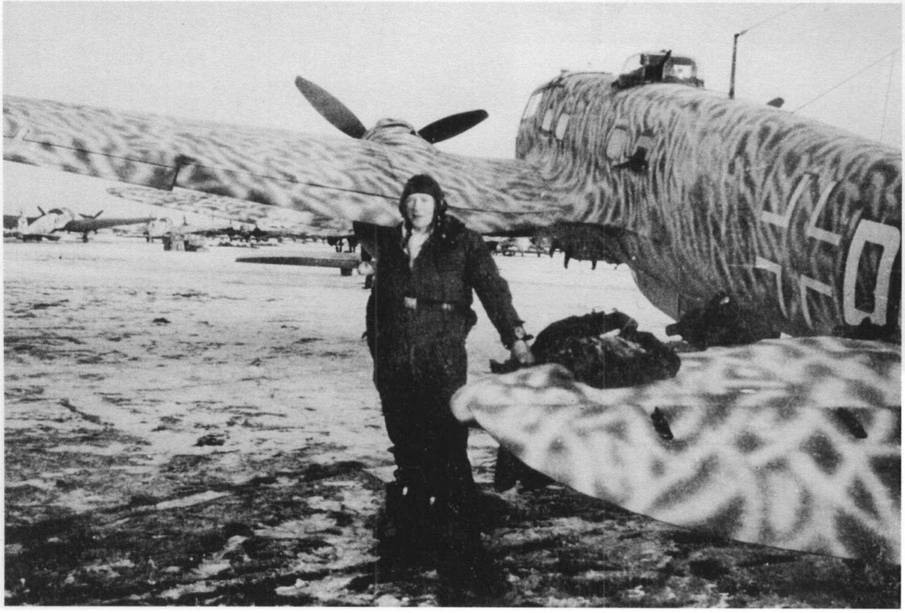
Meanwhile *Wehrmacht* and *Luftwaffe* units found themselves at the end of lengthy supply routes that reached all the way back to Germany. They had to endure frequent shortages of supplies, fuel and munitions, which blunted part of the force of their attacks.

In the autumn of 1942, I. *Gruppe* of *Ergänzungskampfgeschwader* 50, based at Brandenburg/Briest, converted to the Heinkel He 177 A-3. This new variant incorporated several improvements found necessary after the premature service introduction of the A-1 earlier in the year. Following a period of hurried training the unit was re-designated I./KG 50, and sent to Zaporozh'ye in Russia to carry out winter trials.

Siege at Stalingrad

The ferocious battle to take the city named after the Soviet dictator continued without pause until the fourth week in November. Then the Soviet Army launched powerful attacks on either side of Stalingrad, and on the 23rd the jaws of the pincer snapped shut. Inside the pocket was the German 6. *Armee*, with 22 divisions totalling some 330,000 men.

On Adolf Hitler's orders, the troops were not to attempt to fight their way out of the city. Instead they were to hold on to the ground so dearly won, and rely on the *Luftwaffe* to bring in the supplies necessary to sustain them. The success of the airlift operations to Demyansk and Kholm earlier in the year now returned to haunt the *Luftwaffe*.



BELOW: An He 111 H-16 of an unidentified unit wearing the 'scribble' camouflage employed during operations at times when there was only patchy snow on the ground. This and later variants of the Heinkel carried an electrically-powered gun turret in the dorsal position, fitted with a 13 mm MG 131 machine gun.

ABOVE: Major Hans-Georg Bätcher, the Kommandeur of I./KG 100, pictured being greeted following the successful completion of his 600th combat mission in the autumn of 1943. By the end of the war he had flown 682 operational missions, probably more than any other multi-engined bomber pilot.

"Guth fell behind and was torn to pieces by the civilians"

Gerhard Rasch (Bomber Pilot with 6./KG 3)

ABOVE: Air crew being briefed prior to a mission. The Ju 88 A-4 behind is bombed-up and carries the standard camouflage of RLM greens 70/71 with 65 underneath.

I was posted 10.(Erg)/KG 3 at Mons in September 1941. The *IV.(Ergänzungs) Gruppe* (IVth Operational Training Group) was in the process of converting crews from the Dornier 17 Z to the Junkers 88 A but some 37 per cent of the crews making this changeover were lost in accidents. My own crew consisted of *Obgfr.* Otto Wirth (navigator/bomb aimer), *Gef.* Gerhard Guth (radio operator) and *Gef.* Heinz Merten (gunner). We flew frequent missions over England but these were rarely pressed home due to our inexperience. The main purpose of these flights was to draw attention away from the attacks being made by the fully operational units. Therefore we aborted our missions should any serious aerial opposition develop. We did, however, help to support the units providing air cover for 'Operation Cerberus', the escape by the battleships *Scharnhorst* and *Gneisenau* from the channel port of Brest in February 1942.

We did experience problems with intruders and on 23 March 1942 I was shot down by a Hurricane over Beauvais after a long chase over the Channel. We all bailed out but the Hurricane returned on the next two nights, shooting down the Ju 88 piloted by my good friend *Uffz.* Ulrich on the 25th. He and his crew were killed. The next night a flak trap was prepared and the intruder was shot down. Its pilot, a Canadian, was killed.

In April 1942 I was promoted to *Feldwebel* (Sergeant) and posted with my crew to 6./KG 3 on the Russian Front. By this time I had flown 27 missions over England, but because these were flown while I was serving in an *Ergänzungsgruppe*, no credit was given! Nevertheless the posting brought promotion to all my crew and I received the Iron Cross Second Class after flying my first mission in Russia. Perhaps this was some unofficial recognition of our efforts?

All the commanders of KG 3 were famous airmen. Our *Kommodore* was a highly respected and beloved officer, *Oberst* Wolfgang von Chamier-Glisczinski, a *Ritterkreuzträger* who frequently flew with us. An equally admired officer, *Major* Waldemar Krüger who had risen from the ranks, commanded the II./KG 3. Unfortunately he was killed in action soon after I arrived. His place was taken by the previous *Kapitän* of 6./KG 3, *Hptm.* Peter-Paul Breu. Members of our *Staffel* wore yellow scarves as an indication of their unit; the *5.Staffel* wore red.

On 19 April I flew my first mission with my Ju 88 A-4, (5K+DP, W.Nr. 1136). We flew many missions at this time, and consequently losses were relatively high over a long period. Losses were almost entirely due to flak; we had little fear of Russian fighters.

At this time Breu and *Ofw.* Wolfgang Martin were engaged in experimental train-busting sorties flying Ju 88 Cs and Ps. Martin was alleged to have landed on an English airfield during 1940 and captured a mechanic, but he never affirmed this rumour. *Lt.* Zimmermann, who had risen from the ranks, and *Uffz.* Rösner often joined in these train-busting missions, and I also joined this unit within a unit. On my 33rd mission on 21 May 1942 I flew as high cover as *Hptm.* Breu attacked a train south of Kharkov. Two Ratas managed to cling to Breu's tail and so I dived at one, hoping to scare him off. I fired a quick burst from my 20 mm cannon and the Rata exploded in a dirty grey puff of smoke. The other Rata fled (I was later to meet its pilot in Wisconsin). On another occasion an Su-2 reconnaissance aircraft emerged from low cloud near Leningrad in very dirty weather. I opened fire. It was my second victory.

My greatest trial came on 23 June. Returning from a train-busting mission near Moscow, my 64th, I lost an engine due to flak. After bombing the target, I was forced to crash land near a small town 300 km behind the Russian lines. Since this was a train-busting mission I only had *Uffz.* Wirth and *Uffz.* Guth with me. We all managed to drag ourselves from the burning Junkers but were quickly brought to our feet by the shouting from the village. A surging mob of screaming women and children were rushing towards us. We ran in terror towards a river some kilometres away, but the Russians slowly narrowed the gap. Guth fell behind and was torn to pieces by the civilians. His screams pursued us as we plunged into the water and swam across, continuing our flight on the other side. Guth's inhuman screams were only ended by distance.

After living on bark, berries and frogs for seven days, Wirth lost his mind and tried to shoot me. Just as I wrestled the Luger from his demented grasp, a man appeared from a nearby wood. We flung ourselves to the ground as he approached. He began to plough! After some moments I realised that it was a German supplementing his rations; we had reached safety. After this, Wirth was committed to an asylum and I returned to my unit.

Losses in II./KG 3 were high that summer. As Merten had also been wounded in my absence, I collected an entirely new crew. Now I was so embittered by my experience that I never failed to attack that village if I were in its vicinity, often dropping out of formation to do so. I became reckless and was shot down five times during June and July 1942. Some 70 crews were lost by the *Gruppe* during the spring and summer and by November only four remained from the original group that had joined 6./KG 3 in April.

By this time I had completed 207 missions in Russia (some of these counted double if they exceeded six hours). On 18 October I had been awarded the silver cup for bomber pilots and was also recommended for the *Ritterkreuz.* Instead I was awarded the *Deutsche Kreuz* in Gold on 23 December 1942, with special mention being made of my train-busting sorties.

Luftwaffe Bomber Order of Battle 27 July 1942

This table gives the strength of the *Luftwaffe* long-range bomber units on 27 July 1942, little over a year after the invasion of the Soviet Union. On that day the *Luftwaffe* long-range bomber force possessed 46 front line *Kampfgruppen* with 803 serviceable aircraft. For the time being that number would be sufficient, just, to meet operational needs. The major formations on the Eastern Front, *Luftflotten* 1, 4, 5 and *Luftwaffen Kommando Ost*, possessed the lion's share of the combat *Gruppen:* 28. But even there the *Luftwaffe* could no longer be strong at every point along the lengthy battle front. *Luftflotten* 1 and 5, covering Finland and the northern sectors, possessed only eight bomber *Gruppen*.

Elsewhere, *Luftflotte* 2 with 11 *Gruppen* in the Mediterranean area was committed to maintaining the blockade of Malta and supporting the *Afrika Korps* in North Africa. *Luftflotte* 3 in the West employed seven *Gruppen* for the attack on Great Britain and her sea approaches.

LUFTFLOTTE 1, 4 and VIII.*Fliegerkorps* (Russian Front)

LUFTFLOTTE 1 (Northern Front in Russia)

Stab/KG 1	He 111	Dno	2	(1)
II. *Gruppe*/KG 1	Ju 88	Dno	27	(14)
III. *Gruppe*/KG 1	Ju 88	Dno	26	(14)
Stab/KG 53	He 111	Korowje-Selo	4	(4)
I. *Gruppe*/KG 53	He 111	Gostkino	31	(23)
II. *Gruppe*/KG 53	He 111	Korowje-Selo	33	(26)
III. *Gruppe*/KG 53	Ju 88	Smolensk-Nord	44	(29)

LUFTFLOTTE 2 (Mediterranean)

Stab/LG 1	Ju 88	Eleusis	1	(0)
I. *Gruppe*/LG 1	Ju 88	Iraklion	28	(11)
II. *Gruppe*/LG 1	Ju 88	Iraklion	26	(13)
I. *Gruppe*/KG 26	He 111 *(torpedo)*	Grosseto	36	(27)
II. *Gruppe*/KG 26	He 111 *(torpedo)*	Saki	31	(8)
III. *Gruppe*/KG 26	Ju 88 *(torpedo)*	Grosseto	29	(20)
Stab/KG 54	Ju 88	Catania	2	(1)
I. *Gruppe*/KG 54	Ju 88	Gerbini	28	(6)
Stab/KG 77	Ju 88	Gerbini	3	(0)
II. *Gruppe*/KG 77	Ju 88	Gerbini	27	(5)
III. *Gruppe*/KG 77	Ju 88	Comiso	27	(12)
II. *Gruppe*/KG 100	He 111	Athens/Kalamaki	25	(12)
KGr 606	Ju 88	Catania	18	(6)
KGr 806	Ju 88	Catania	18	(8)

LUFTFLOTTE 3 (France, Belgium and Holland)

Stab/KG 2	Do 217	Soesterburg	2	(2)
I. *Gruppe*/KG 2	Do 217	Gilze-Rijen	29	(21)
II. *Gruppe*/KG 2	Do 217	Eindhoven	26	(15)
III. *Gruppe*/KG 2	Do 217	Arnhem-Deelen	35	(29)
I. *Gruppe*/KG 40	He 177	Bordeaux-Merignac	30	(16)
II. *Gruppe*/KG 40	Do 217	Soesterburg	30	(28)
III. *Gruppe*/KG 40	Fw 200	Bordeaux-Merignac	20	(11)
	Ju 88 C	Bordeaux-Merignac	4	(1)
KGr 106	Ju 88	Dinard	31	(23)

LUFTFLOTTE 4 (Southern Front in Russia)

III. *Gruppe*/LG 1	Ju 88	Kerstowo	28	(11)
Stab/KG 27	He 111	Kursk	2	(2)
I. *Gruppe*/KG 27	He 111	Kursk	32	(20)
II. *Gruppe*/KG 27	He 111	Kursk-Ost	31	(21)
III. *Gruppe*/KG 27	He 111	Kursk	31	(8)
Stab/KG 51	Ju 88	Stalino	2	(0)

I. *Gruppe*/KG 51	Ju 88	Stalino	30	(17)
II. *Gruppe*/KG 51	Ju 88	Saporoshje	33	(8)
III. *Gruppe*/KG 51	Ju 88	Stalino	28	(8)
Stab/KG 55	He 111	Kramatorskaja and Samorsk	4	(4)
I. *Gruppe*/KG 55	He 111	Barwenkowo and Kuteinikowo	21	(19)
II. *Gruppe*/KG 55	He 111	Kramatorskaja	30	(21)
III. *Gruppe*/KG 55	He 111	Kramatorskaja	29	(20)
Stab/KG 76	Ju 88	Bejyj-Kolodes	3	(2)
I. *Gruppe*/KG 76	Ju 88	Bejyj-Kolodes	27	(13)
II. *Gruppe*/KG 76	Ju 88	Bejyj-Kolodes	33	(14)
III. *Gruppe*/KG 76	Ju 88	Bejyj-Kolodes	38	(12)
Stab/KG 100	He 111	Saki	1	(1)
I. *Gruppe*/KG 100	He 111	Saki	37	(13)

***LUFTWAFFENKOMMANDO OST* (Central Front in Russia)**

Stab/KG 3	Ju 88	Schatalowka	2	(2)
I. *Gruppe*/KG 3	Ju 88	Schatalowka	34	(15)
II. *Gruppe*/KG 3	Ju 88	Schatalowka	27	(16)
III. *Gruppe*/KG 3	Ju 88	Schatalowka-Ost	27	(19)
Stab/KG 4	He 111	Seschtschinskaja	3	(3)
I. *Gruppe*/KG 4	He 111	Seschtschinskaja	26	(23)
II. *Gruppe*/KG 4	He 111	Seschtschinskaja	25	(19)
III. *Gruppe*/KG 4	He 111	Charkow-Woitschenko	35	(18)

***LUFTFLOTTE* 5 (Norway, Finland)**

I. *Gruppe*/KG 30	Ju 88	Banak	35	(29)
II. *Gruppe*/KG 30	Ju 88	Banak	37	(26)
III. *Gruppe*/KG 30	Ju 88	Bardufoss	36	(32)

***LUFTWAFFENBEFELSHABER MITTE* (Metropolitan Germany)**

No frontline long-range bomber units on this date.

Operating side by side with a mixed bag of aircraft, mainly Junkers Ju 52s, were some 200 He 111s. The latter, drawn from KG 27, KG 55 and I./KG 100, were diverted from their normal tasks to take part in the airlift. The Heinkel units came under the operational command of *Obstlt.* Dr. Ernst Kühl, the *Kommodore* of KG 55, with its headquarters at Morozovskaya.

For much of the time flying conditions were atrocious. Rarely would there be an entire day with clear skies throughout the area. On many days the base airfields were weathered in so aircraft could not take off; or fog shrouded airfields in the pocket prevented the incoming transports from landing. Along the route, the thick layers of cloud often produced severe icing conditions. These factors, coupled with the poorly equipped forward airfields, meant that several aircraft were wrecked in landing or take-off accidents.

Initially each Heinkel carried between one and two tons of munitions or foodstuffs, depending on the density of the load, during each of their sorties into the pocket. On their return flights they brought out the wounded. From time to time Soviet fighters were active in the area, and they inflicted serious losses on the slow and poorly armed Ju 52 transports. Under these conditions the He 111s, flying in disciplined formations and with mutually interlocking fields of fire, performed much more effectively and they were able to drive away potential attackers.

I./FKG 50, with its new He 177s and under the command of *Major* Schede, was also pitched into the airlift operation. Yet with little space in the fuselage to carry supplies, and less room to bring out the wounded, aircraft for aircraft they were less effective than the He 111s. On 16 January, *Major* Schede, his crew and aircraft were lost, presumed due to technical problems. A former anti-shipping pilot with KG 40 and *Ritterkreuzträger*, *Hptm.* Heinrich Schlosser, took

ABOVE: Destruction at Stalingrad. After a series of piecemeal attacks which the Soviets destroyed, a major German assault succeeded in reaching the suburbs, but once German troops attempted to move into the built-up areas, the battle developed into two months of bitter house-to-house fighting during which neither side gained any advantage. While holding off the German attack, the Soviets prepared a massive counter-attack.

command of I./FKG 50. After suffering losses during operations from primitive forward airfields, the He 177s reverted to their bombing role.

Early in 1943 a new Soviet offensive threatened the He 111 base at Morozovskaya, and these aircraft were forced to make a hurried evacuation of the airfield to avoid being overrun. From then on the bombers operated from Novocherkassk, 338 km (210 miles) from Stalingrad. But because of the greater distance from the new base, the Heinkels could fly only one supply mission into the pocket each day.

Following the Soviet capture of Pitomnik, the main re-supply airfield within the pocket, in mid-January, supplies had to be parachuted into the besieged city. That reduced the average load carried by the Heinkels on each sortie to just over half a ton. From then on conditions for the troops besieged in Stalingrad deteriorated rapidly, and the last of them surrendered on 2 February 1943. The attempt to sustain 6. *Armee* by air had cost the *Luftwaffe* 490 aircraft, including 165 He 111s.

Low Altitude Attack Tactics

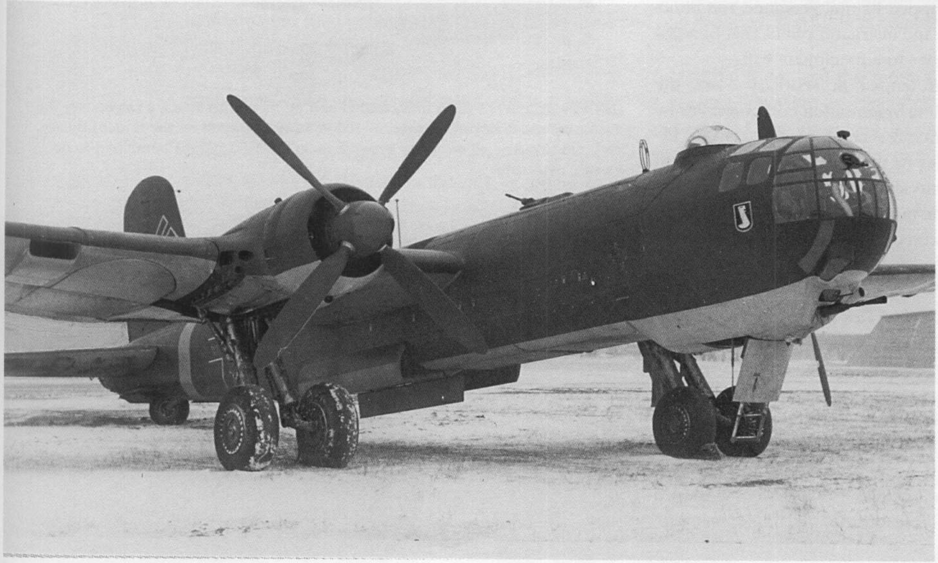
When operating in the close support role to assist *Wehrmacht* units, long-range bombers were sent to attack moving or ill-defined targets. Sometimes they had a ground controller to guide them to their target, sometimes not. If there was not, they had first to conduct an armed reconnaissance of the battle area, at altitudes below 300 m (1,000 ft). Usually the aircraft flew in units of between two and four aircraft. Once they found a worthwhile target, the bombers had to circle it to align themselves for their bombing runs. The relatively large and slow aircraft then flew over the target a second time, having forfeited any advantage of surprise, to deliver their attacks from low altitude. That rendered them vulnerable to ground fire, and resulted in serious cumulative losses.

Each long-range bomber lost in this way represented a double loss compared with a small, ground-attack aircraft or a dive-bomber. Not only was it a much more expensive aircraft with two engines, but it carried a crew of four or five trained men that would need to be replaced.

Because of the additional risk, long-range bombers should have been employed in low-altitude attacks in the battle area only in exceptional circumstances, for example to disrupt an imminent enemy attack that might overrun a friendly position. Yet, as the war progressed, long-range bombers were sent on close support operations on many occasions when no critical situation existed. There was a perceived need to keep air units occupied, and *Luftflotte* commanders feared they would lose their units to other parts of the front if they did not commit them to action often enough. Thus in quiet sectors there was pressure to keep air units continually in action mounting small-scale attacks, even when there was little chance of achieving useful results. Air crews were not allowed adequate time for rest or additional training, though the latter was particularly needed given the uneven training received by replacement crews during the mid-war period.

In this context it is important to note that the *Luftwaffe* had no system of operational tours with a fixed number of missions for combat aircrew, as in the RAF or the US Army Air Forces. *Luftwaffe* crews remained in action continually; their only breaks from combat flying came during their limited periods of leave, or when their unit was withdrawn from action to re-form or re-equip with a new aircraft type or sub-type. Thus many aircrew eventually became worn out, both mentally and physically.

RIGHT: Armourers carry out final adjustments on an SC 250 bomb mounted under the fuselage of an He 111. Note the compressed cardboard whistling attachments fitted to the fins, intended to increase the weapon's effect on enemy morale.



ABOVE LEFT, ABOVE AND LEFT: A few He 177 A-1s of KG 50 were used in the supply of the encircled German 6.Armee at Stalingrad. They operated out of the airfield at Saparoshje-Süd, but suffered constantly from mechanical problems and several machines were lost due to this. In addition, the He 177 also proved to be unsuited for the task of transport since its storage capacity was very small and this, coupled with the major continuing mechanical problems, meant the aircraft was quickly withdrawn from such operations. In fact, no He 177s were lost to to enemy action at Stalingrad – all losses were due to mechanical failure. All aircraft carried the standard European camouflage of 70/71 and 65.

ABOVE: Besides using its bombers for supply runs, the Luftwaffe used its ubiquitous Ju 52/3ms on ambulance duties in order to ferry out wounded soldiers from Soviet encirclement. Here, amidst bitter Russian weather, wounded flown from a pocket are being unloaded onto a horse-drawn sledge.

ABOVE: During actions to support German army units which were in difficulty on the Eastern Front, long-range bombers were often sent in at low altitude to bomb and strafe targets. Over a period, however, the use of these tactics led to severe cumulative losses of aircraft and crews.

The Impact of the Stalingrad Disaster on the German Long Range Bomber Force

The *Luftwaffe* lost 490 aircraft during the Stalingrad airlift, of which 165 were Heinkel He 111s and 266 were Junkers 52s. However the loss of the latter affected the long-range bomber force far more seriously than the loss of the former. During February 1943, the Heinkel plant at Rostock delivered 185 new He 111s to the *Luftwaffe*, sufficient to replace the losses of these aircraft. On the other hand, only 55 Ju 52s were delivered in February 1943; it took five months' production to replace these versatile machines.

To assemble the large number of aircraft and pilots needed for the airlift, the *Luftwaffe* stripped its multi-engined and blind-flying training schools of Ju 52s and instructor pilots. That brought the training of new bomber crews to a precipitate halt.

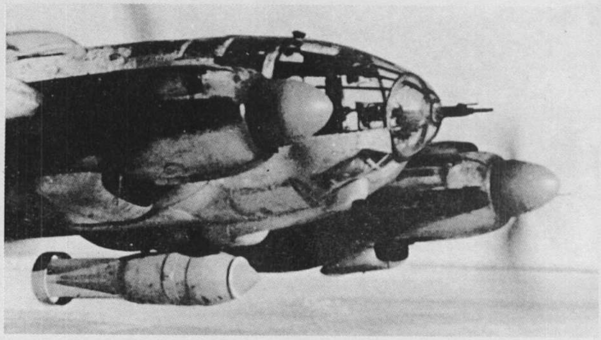
When the Stalingrad airlift ended in February 1943, the problems facing the flying training organisation continued. For by then the *Luftwaffe* transport force was committed to a large-scale airlift carrying men and supplies to the German forces in North Africa. Operational transport units short on their establishment of aircraft were loath to give up the machines recently acquired, and relatively few of the commandeered Ju 52s found their way back to the training schools.

Thus the airlift operations caused a major hiatus in the training of long-range bomber crews. The initial training schools produced a surplus of partially trained pilots, but there was a dearth of trained crews to fill places at the operational training units. The lack of trained replacement bomber crews, to replace those lost in action, quickly brought about a reduction in the combat effectiveness of the long-range bomber force.

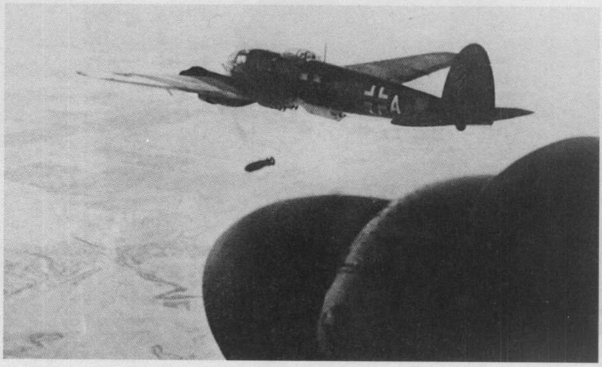
By mid-May 1943, the majority of long-range bomber *Gruppen* were below or well below their establishment in trained crews. Only three out of the 26 long-range bomber *Gruppen* then in the front line possessed 30 or more fully trained crews, close to their establishment. A further six *Gruppen* possessed 18 or more fully trained crews, giving them half or over half of their establishment. The remaining 17 *Gruppen* possessed less than half their establishment of fully trained crews. The six weakest *Gruppen* possessed nine or less fully trained crews, less than one-quarter of their establishment.

The shortage of capable crews in so many units produced a cycle of ineffectiveness that afflicted almost the entire bomber force. It meant that experienced crews had to fly more than their share of the sorties, and each such crew lost decreased the effectiveness of the *Gruppe* by that proportional amount. Yet because of the operational demands made on units, partially trained crews had to be sent on combat sorties. These crews often failed to press home attacks or even locate their targets, particularly at night. Moreover, due to faulty navigation and lack of experience, losses among undertrained crews were disproportionately heavier than for those with the full training.

Only in June 1943 were effective steps taken to revive the bomber crew training organisation, but by then much damage had been done. Even with a reduction in the training time given to aircrew, it would take almost until the end of the year to restore units to nearly their full combat strength.

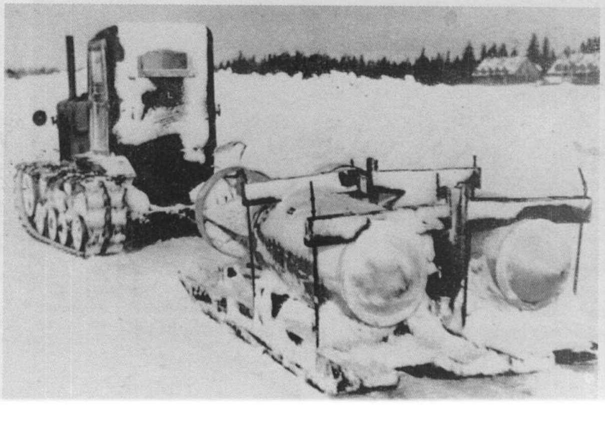


ABOVE: An He 111 of an unidentified unit on its way to attack a target over the Eastern Front. It carries a single SC 1000 (2,200 lb) bomb on the under-fuselage rack. On this type all weapons larger than an SC 250 (550 lb) bomb had to be carried externally.



ABOVE: A He 111 of an unidentified unit drops its single SC 1000 bomb over the target.

BELOW: In the severe Russian winter weather, normal forms of transport were often found to be less efficient and more primitive forms of vehicles were improvised. Here a wooden sledge is being used to transport bombs around an airfield.

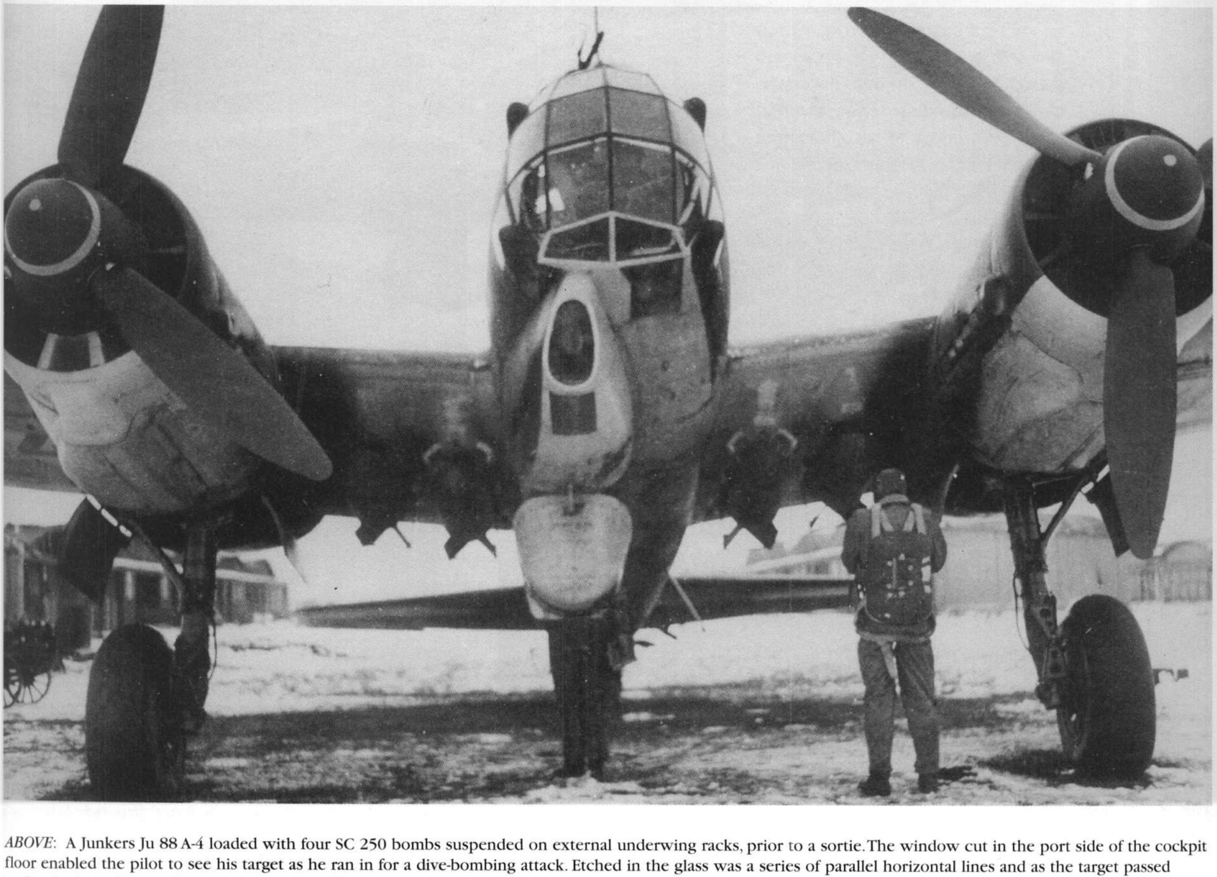


After Stalingrad

Following its major victory at Stalingrad, the Soviet Army launched a massive onslaught along the central part of the front, which drove the *Wehrmacht* back as far as 483 km (300 miles) in places until supplies ran out and the offensive ground to a halt. In the third week of February the German Army mounted a counter-offensive with massive air support, which stabilised the Front and recovered a small part of the territory lost.

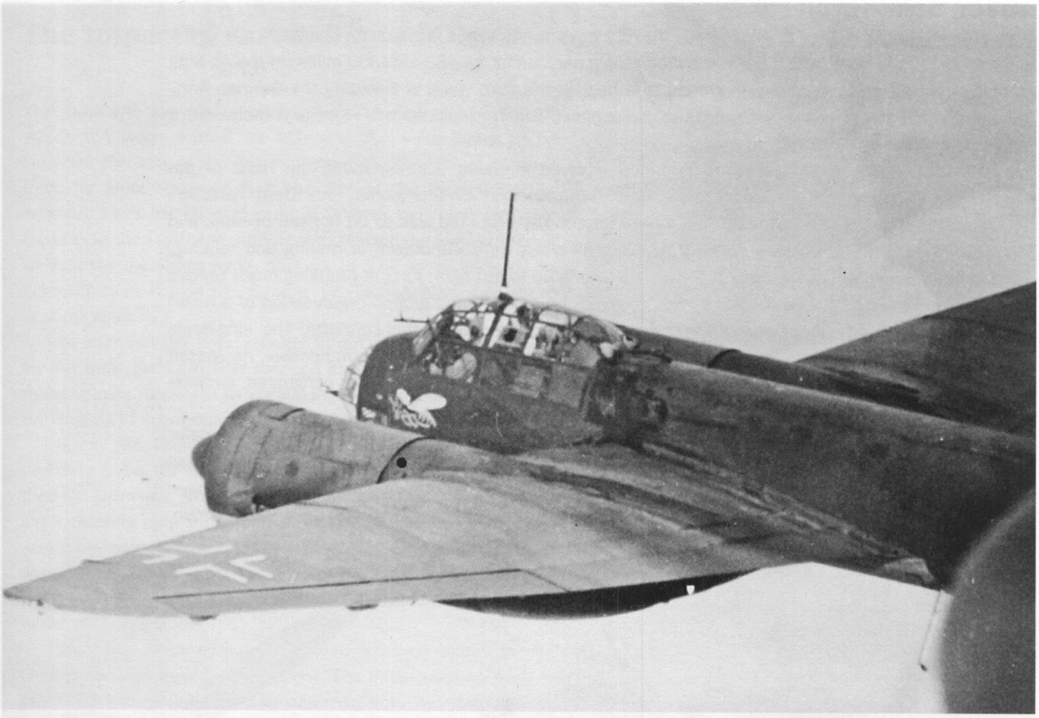
Luftflotte 4, the main *Luftwaffe* formation involved in these actions, made the most of the breathing space now gained. Its new commander, *Generaloberst* von Richthofen, took stern measures to restore the fighting efficiency of his battered forces. His first step was to rid himself of weak and depleted units. During February eight *Gruppen* of all types were withdrawn for resting and refitting, leaving behind their aircraft to bring the remaining units up to strength. Aircraft requiring major repairs were written off and stripped for parts. That relieved the overstrained ground organisation of a heavy workload, without any diminution in the effective fighting strength of the *Luftflotte*. The long-range bomber force benefited particularly from this measure. Moreover, following the withdrawal, its aircraft now operated from relatively well constructed, equipped and supplied, and far less congested, airfields in what had been the rear area.

Both sides now settled down to await the end of the spring thaw, and the renewal of offensive operations when the ground dried out sufficiently. For its part the German High Command began massing forces for an all-out offensive on the central part of the Front, Operation *Zitadelle*, intended to defeat Soviet forces in the large salient around the city of Kursk. That operation, and its aftermath, will be described in detail in the next and final Volume in this series.

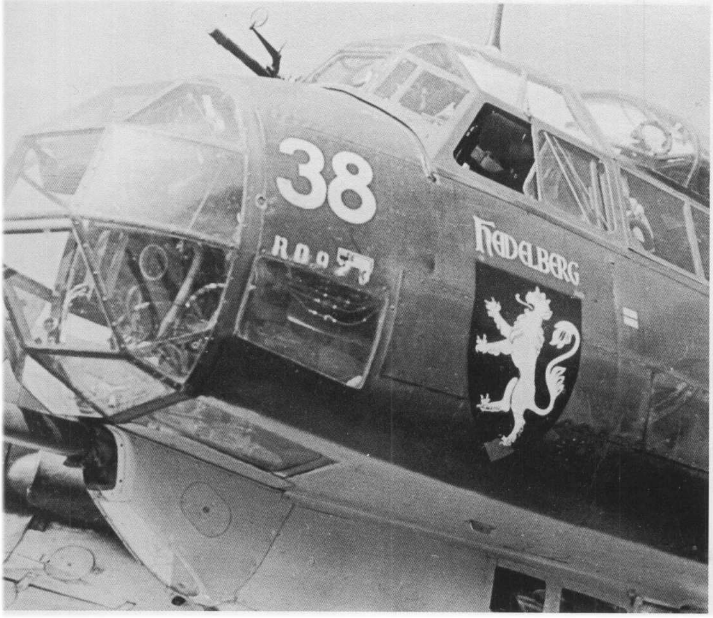


ABOVE: A Junkers Ju 88 A-4 loaded with four SC 250 bombs suspended on external underwing racks, prior to a sortie. The window cut in the port side of the cockpit floor enabled the pilot to see his target as he ran in for a dive-bombing attack. Etched in the glass was a series of parallel horizontal lines and as the target passed under the last of these, the pilot initiated his 60 degree attack dive. The window set in the front of the blister on the starboard underside was the view-piece of the Lotfe periscope bombsight, used during horizontal attacks.

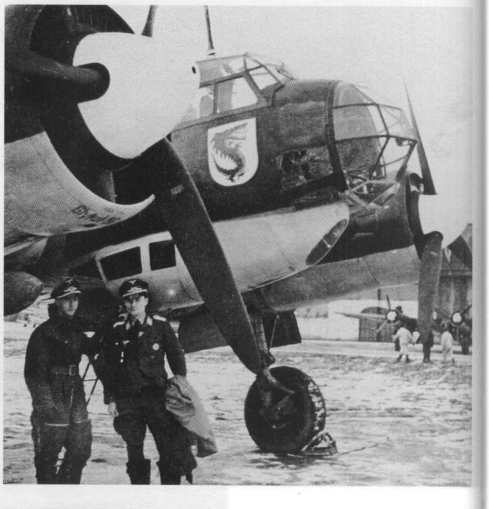
LEFT: Many aircraft of the Stab of III./Gruppe of KG 76, carried the unit's hornet emblem on the nose.



BELOW: A Ju 88 A-4 of 7./KG 76, with the stylised dragon emblem of 7. Staffel on its nose.



ABOVE: A Ju 88 A-4 of III./KG 76 adorned with that Gruppe's emblem, the rampant lion on the coat of arms of the city of Heidelberg.

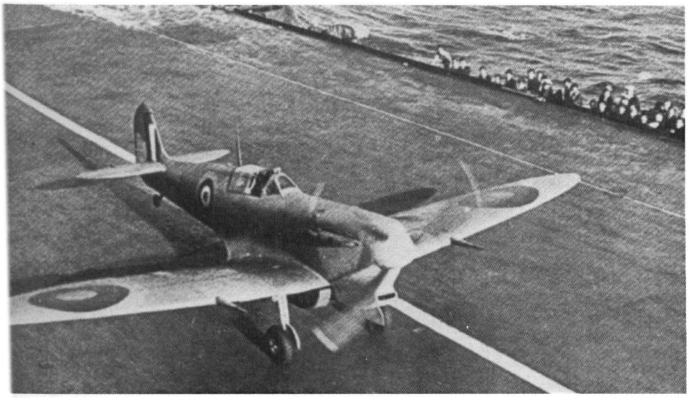


LEFT: Hauptmann Karl-Hermann Millahn flew with 1./KG 76 from September 1940. He was very active on the Eastern Front and received the Ritterkreuz early February 1944 after amassing 375 combat missions. By war's end he had held the rank of Major and served as Kommandeur of IV./KG 76.

The Mediterranean Theatre

During the first two months of 1942 the *Luftwaffe* continued to mount small- and medium-scale attacks on Malta, whenever the weather allowed. The main targets were the island's airfields and the naval dockyard, with the aim of disrupting operations by RAF and Fleet Air Arm aircraft and Royal Navy submarines. These had been taking a mounting toll of Axis shipping which were conveying men, equipment and supplies to North Africa.

By the end of the first week of March 1942, Malta's air defences were in poor shape, and the island was down to its last few serviceable Hurricanes. Then, on 7 March, came the first delivery to the island of Spitfires. Fifteen of these fighters were carried about halfway from Gibraltar to Malta aboard the aircraft carrier *HMS Eagle*. At a point off the coast of Algeria the fighters took off and flew the remaining 1,062 km (660 miles) to the island.



ABOVE: During 1942, the air defence of Malta was sustained by the arrival of a total of 367 Spitfires which were flown off aircraft carriers. HMS Eagle made nine separate voyages between March and July, and in this photograph, a Spitfire V, carrying a 90 gallon ferry tank beneath the fuselage and with a Vokes tropical filter fitted under the nose, is taking off from HMS Eagle's flight deck. On her final voyage, Eagle's task was convoy protection and she carried only Sea Hurricanes and Swordfish.

The Spitfires arrived in the nick of time, for the *Luftwaffe* was concentrating air units in Sicily and the south of Italy, to mount an intensive bombardment of Malta in preparation for the invasion of the island. The first of the new series of heavy air attacks took place on 20 March, targeted on Takali airfield where the newly arrived Spitfires were based. A force of 63 Ju 88s drawn from I./KG 54, II. and III./KG 77, KGr 606 and KGr 806, with a powerful fighter escort, put down a heavy concentration of bombs on the fighter base. The raid destroyed several of the precious fighters and put the airfield temporarily out of action.

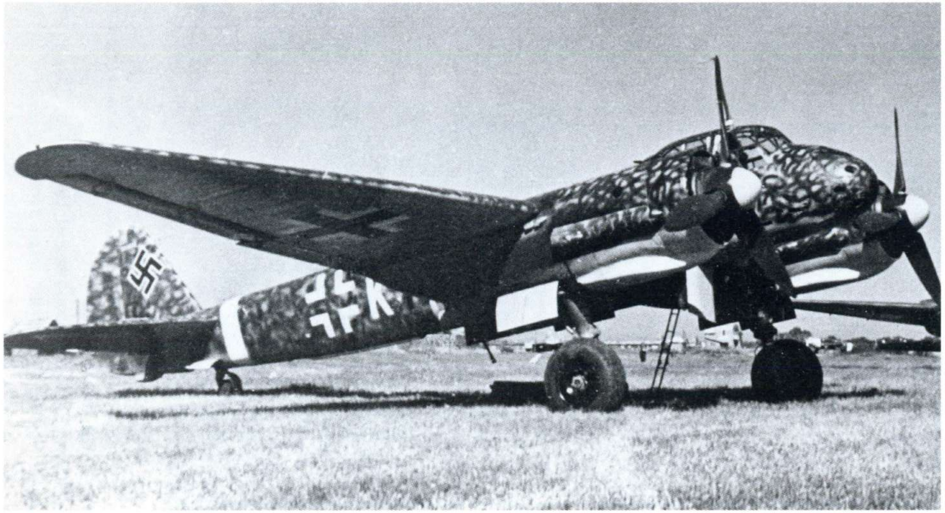
On the following day the *Luftwaffe* repeated the onslaught on Takali, this time with 106 Ju 88s with a strong fighter escort. By the end of the attack only two of the original batch of Spitfires remained serviceable, but on that day a further nine of these fighters arrived from HMS *Eagle*.

This set the pattern for the next six weeks, with heavy attacks on the island and on incoming supply convoys by strong forces of Ju 87s and Ju 88s. The island's Spitfires and Hurricanes engaged these raiders with their dwindling strength. When no fighters could be launched, Malta's AA gunners maintained a vigorous defence of the main targets. During these actions both sides suffered losses. Throughout this time soldiers and Maltese civilians made strenuous efforts to repair bomb damage and keep the island's airfields, and its naval dockyard and harbour, in working order. At intervals, Royal Navy carriers delivered further batches of Spitfires to replace those lost.

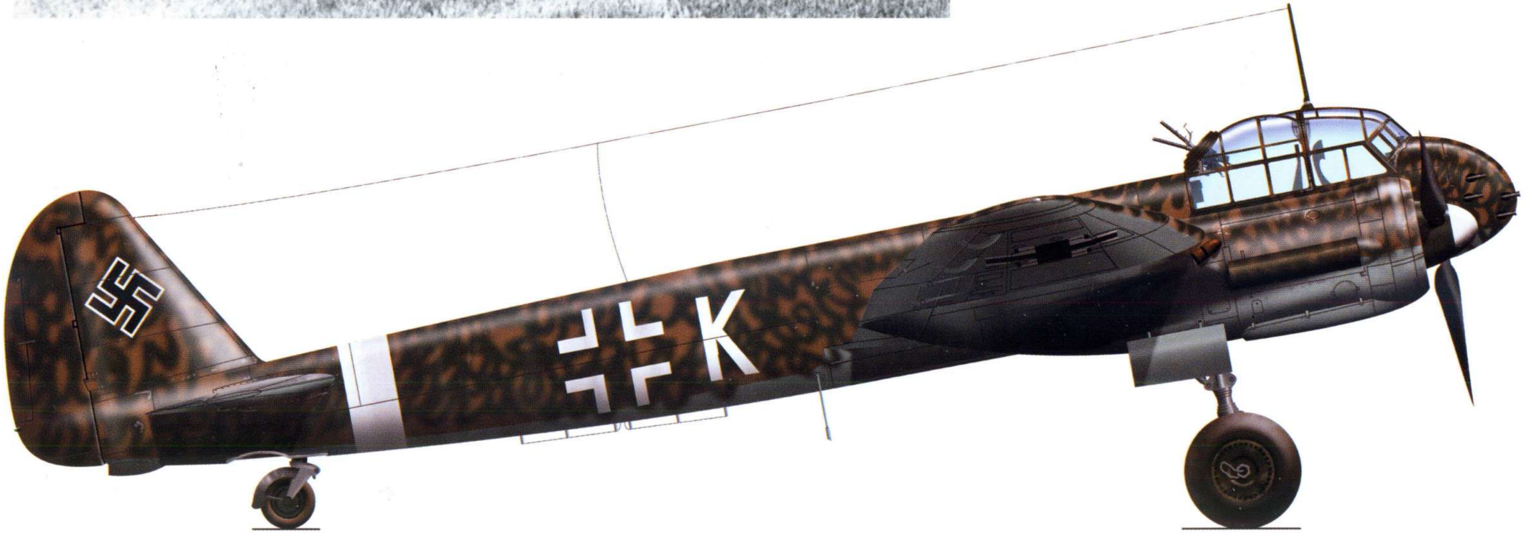
The series of heavy air attacks temporarily subdued Malta as a base for attacks on Axis convoys carrying supplies to North Africa. Many torpedo bombers and submarines were wrecked or damaged, and those that survived were withdrawn to safer areas. Moreover, the tight air and sea blockade of Malta prevented the delivery of supplies to the island, and its population was reduced to near-starvation rations. Had the *Luftwaffe* been able to maintain that pace of operations, Malta would have caused no further trouble. But it was not to be. In mid-May the *Baedeker* raids against England were in full swing and two *Gruppen* of Ju 88s, II. and III./KG 77, were transferred from Sicily to bases in France to take part in these attacks. The bombers returned to Sicily eight weeks later, but in the interim the move reduced the effectiveness of the raids on Malta.

By the middle of 1942 sufficient Spitfires had been delivered to Malta to meet the island's air defence needs. The German and Italian air and naval blockade made it far more difficult to supply the island, however. Each such operation involved a major fleet action, and even then only a small proportion of the merchant ships that set out got through to discharge their cargoes.

The climax in this series of dramatic actions – Operation 'Pedestal' – took place in August 1942. Fourteen freighters were assigned to the operation. Their escorting force comprised three aircraft carriers with a total of 73 deck-landing Sea Hurricane Martlet and Fulmar fighters. Two battleships, six

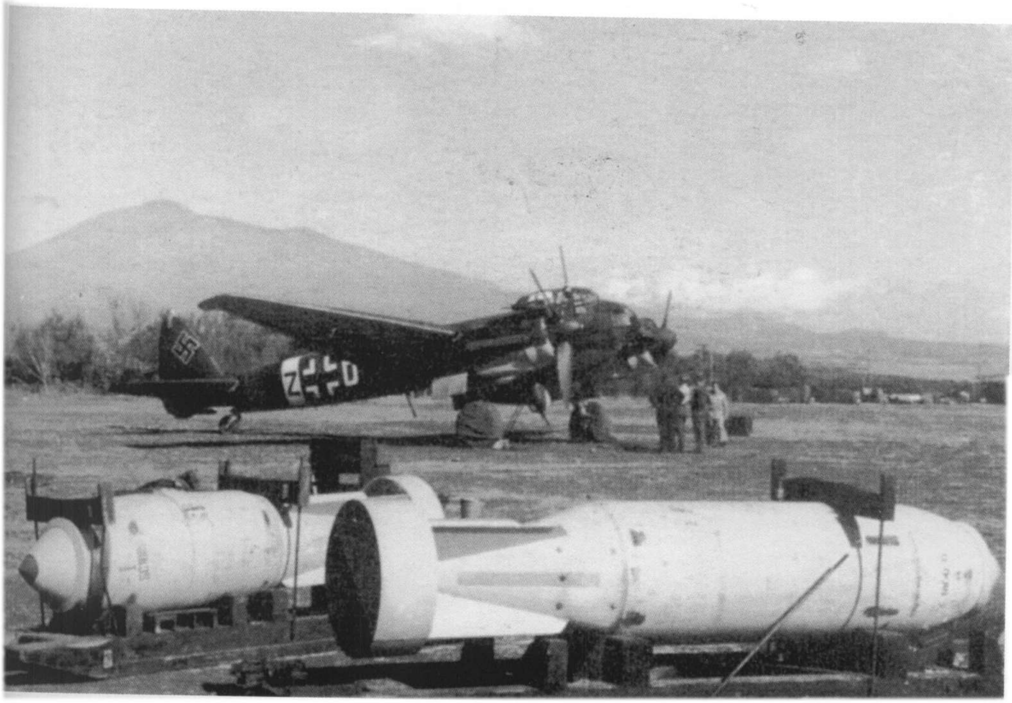


LEFT: A Ju 88 C-6 of 1./KG 76 based at Catania in Sicily where I. Gruppe of KG 76 were based from December 1942 to March 1943.

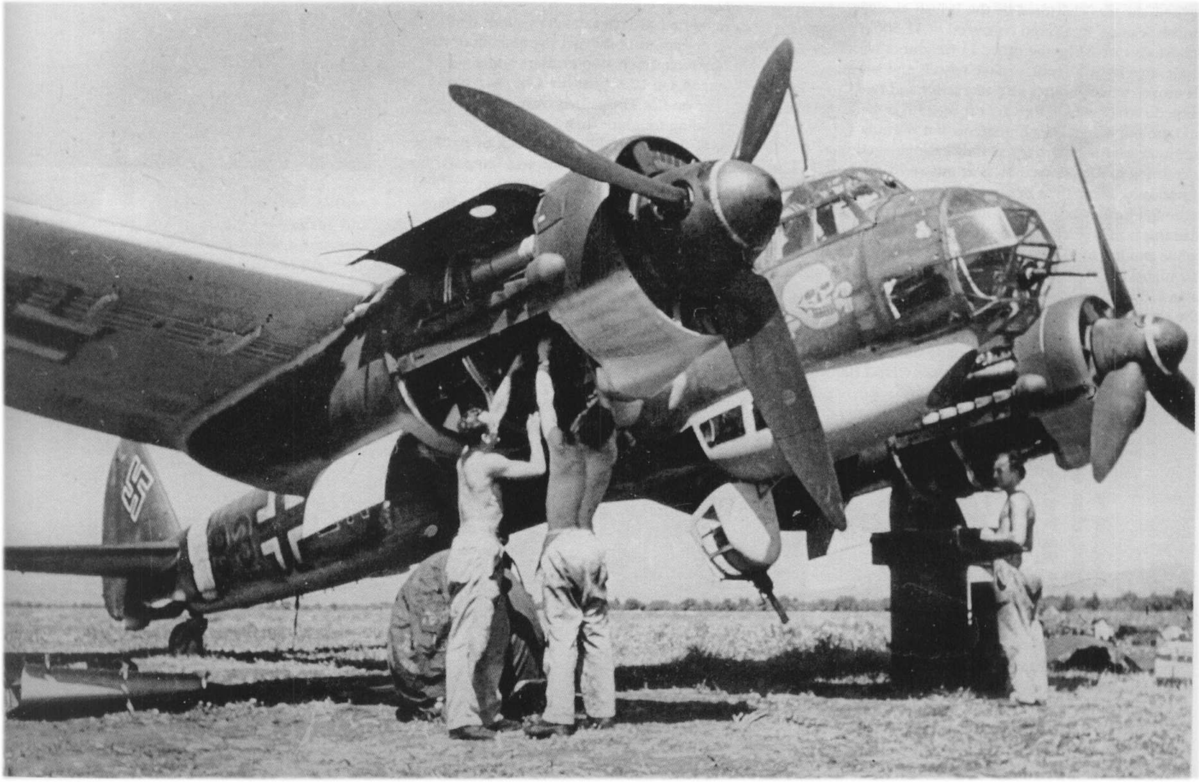


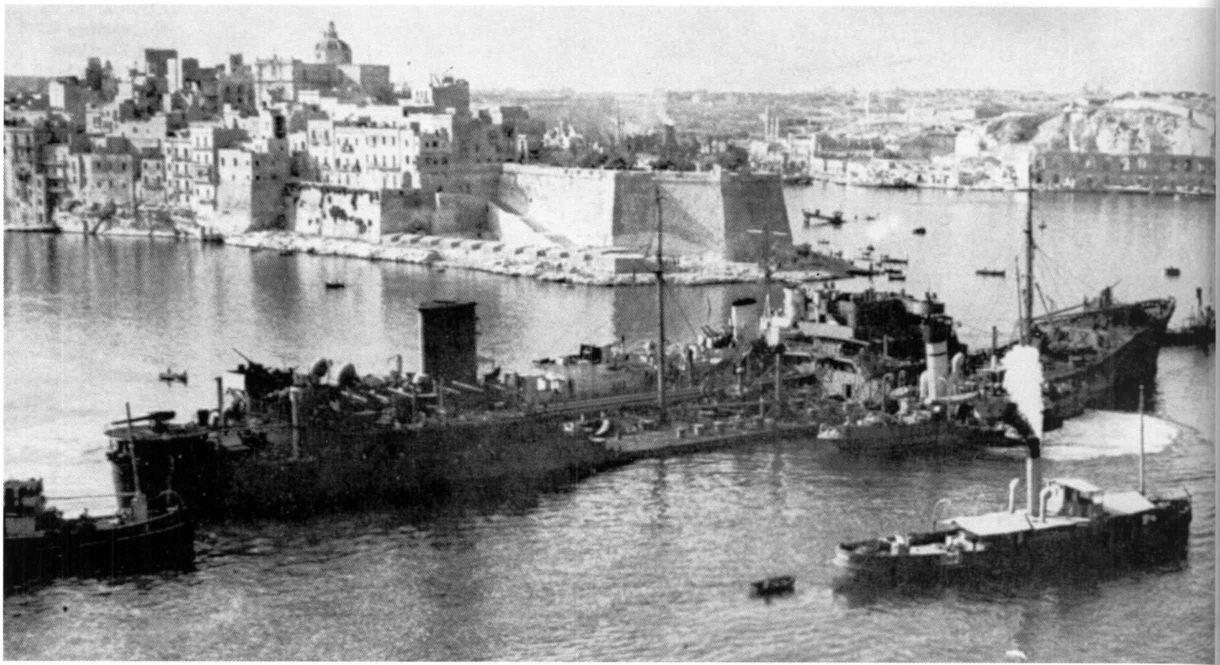
Junkers Ju 88 C-6 of 1./KG 76 based at Catania in Sicily during the early spring of 1943

It has dark green (probably RLM 71) sprayed over its pale blue (RLM 65) finish in a 'scribble' pattern. The white rear fuselage band was carried by most German aircraft operating in the Mediterranean theatre.

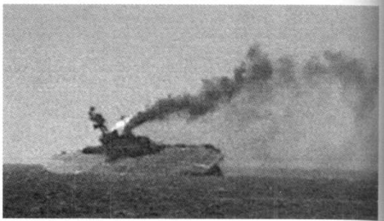


THIS PAGE: In July 1942 Feldmarschall Albert Kesselring assembled six Ju 88 Gruppen for a renewed attack on Malta. These consisted of KGr.606, KGr. 806, two Gruppen from KG 54 and two from KG 77. These photographs show ground staff preparing Ju 88 A-4s from KG 77 *LEFT* and from KG 54 *BELOW* for another strike mission over the island.

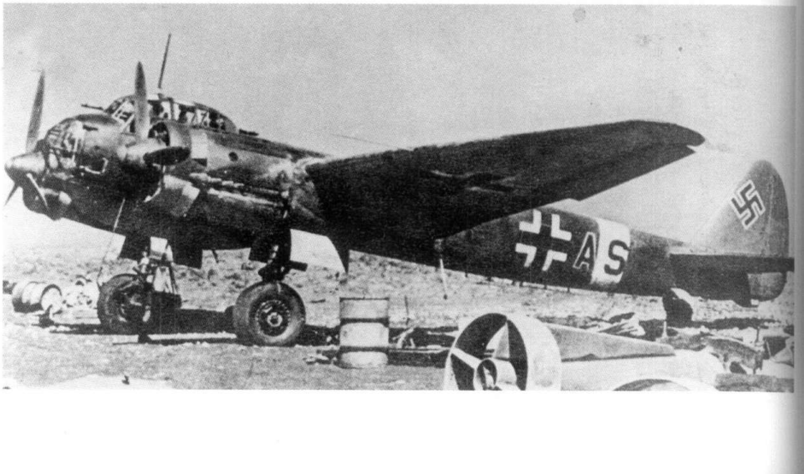




ABOVE: The large tanker Ohio became the most famous vessel of Operation 'Pedestal'. Although American owned, she was chartered by the British Ministry of War Transport and was commanded and manned by British seamen. Her cargo consisted of 11,500 tons of kerosene and oil-fuel, as vital to Malta's survival as the foodstuffs carried by the other 13 freighters which took part in the operation. Following the sinking of HMS Eagle, attacks by aircraft, surface vessels and submarines sank nine merchantmen, two cruisers and a destroyer, while another aircraft carrier and two cruisers were damaged. On 12 August the Ohio survived a torpedo attack which tore a 24 ft by 23 ft hole in her side and set her on fire. These fires were extinguished and the crippled tanker limped on, but burning debris from an exploding freighter then set her cargo of kerosene on fire and this was only extinguished with difficulty. On the 13th, the Ohio was struck by parts of a crashing Ju 87 followed by near misses by six bombs which stopped her engines and she was temporarily abandoned. There then began a long struggle to take the huge, unwieldy and deeply laden tanker in tow, and although further near misses increased the damage and flooding, she was slowly got under way again. Hardly had this been achieved than the tanker again came under air attack, one bomb falling close under her stern while another exploded in her engine room. Once again, the crew was taken off, but by the morning of 14 August the Ohio, lashed to two destroyers and towed by a minesweeper, was moving again. In another air attack, the vessel was holed yet again by a 1,000 lb bomb which exploded under the stern but, on the 15th, the slowly sinking tanker was finally brought into Malta's Valletta harbour and 10,000 tons of her cargo was saved. Fine seamanship, endurance and a persistence to effect a succession of damage repairs long after all hope seemed to have been lost, made the story of the Ohio an epic of the sea. In this photograph, the Ohio, well down in the water, lies in Valletta's Grand Harbour at the end of her voyage.

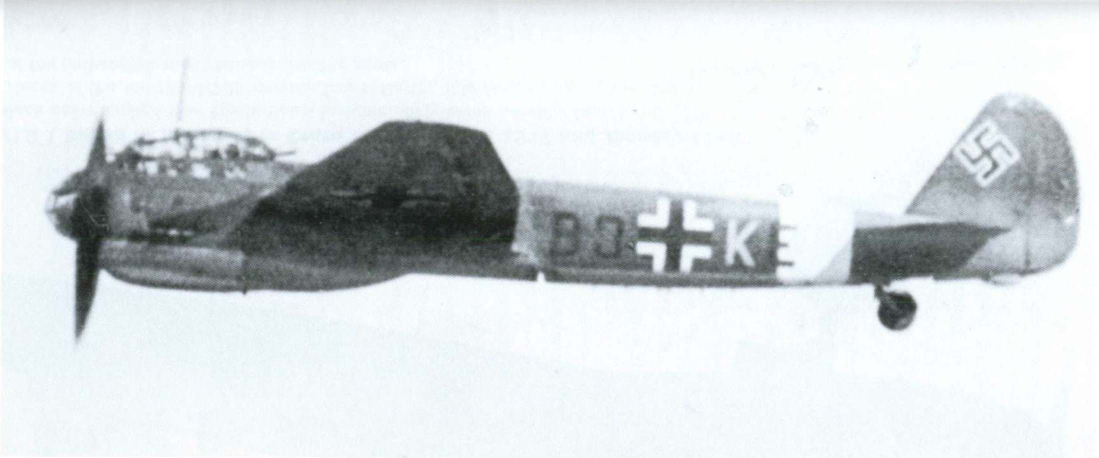


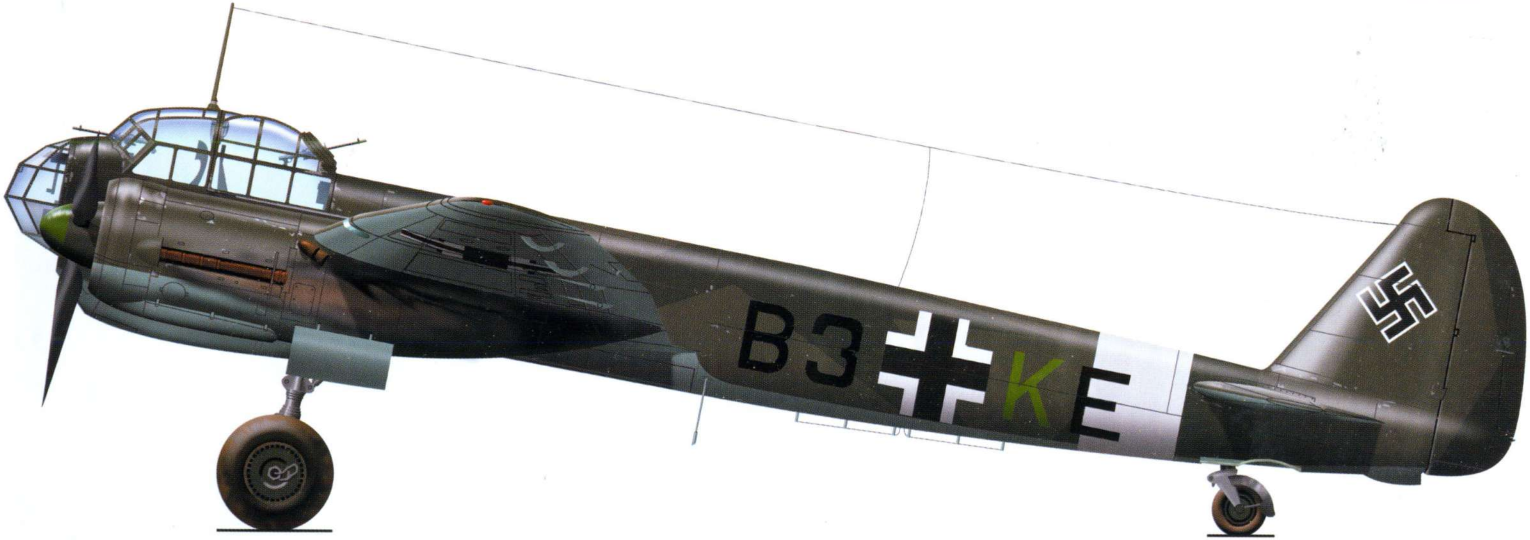
ABOVE: When the convoy of 14 merchant ships and its fleet escort comprising 'Pedestal' was first detected, a series of ambushes was set across its likely course. The first included nine submarines spread out north of Algiers and U-73 found itself exactly in the convoy's path. At noon on 11 August 1942, four torpedoes hit the aircraft carrier HMS Eagle, which sank within eight minutes, taking 200 of her crew with her.



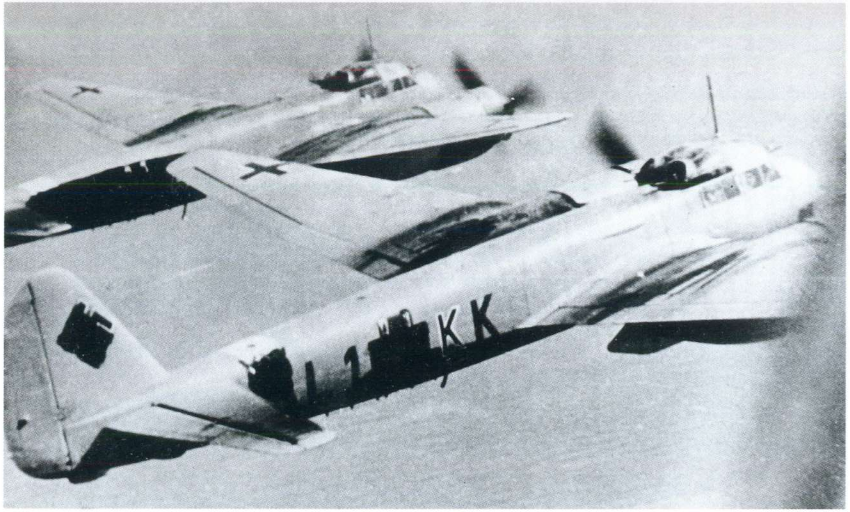
RIGHT: For most of September 1942, the Ju 88 Gruppen of II. and X. Fliegerkorps were engaged on long convoy patrols which, while routine work, were tiring for the crews. On the evening of 28 September 1942, Kesselring issued an order mentioning the great signs of fatigue evident in the Ju 88 crews and, while calling for a reduction in their tasks, ordered that any daylight attacks were to be carried out only by fighter-bombers. This Ju 88 belonged to LG 1 which had also taken part in the air operations against Malta.

RIGHT: This Ju 88 A-4 of IV./KG 54, was part of a processing unit where new crews joining the Geschwader received operational training.

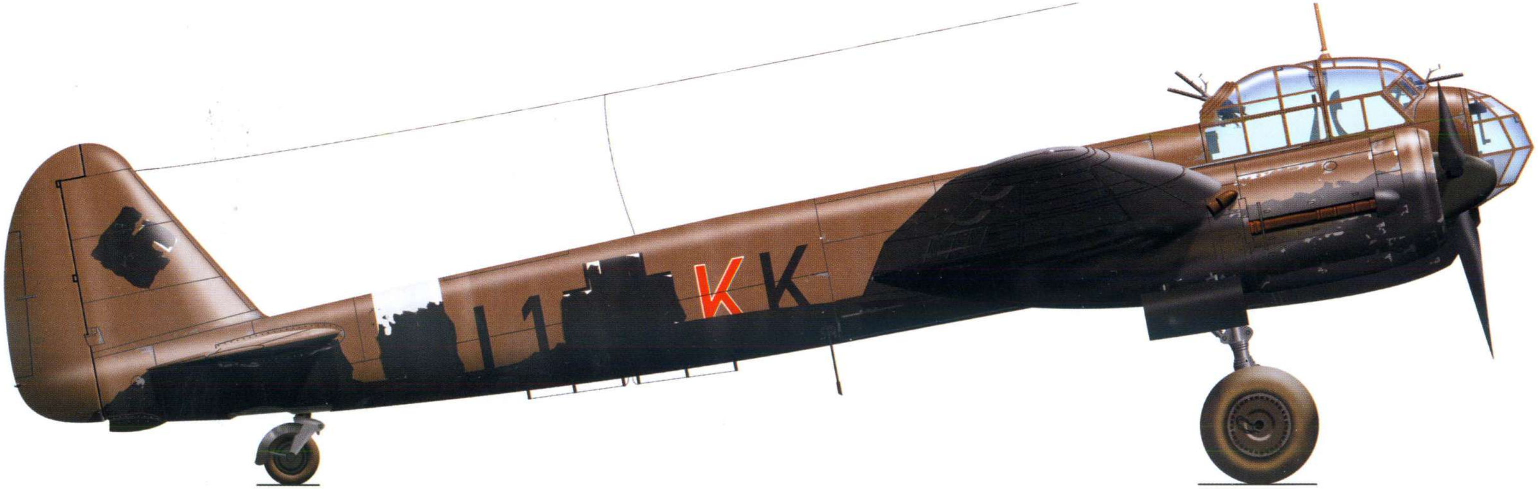




Junkers Ju 88 A-4 of IV.(Erg)Gruppe Stab/KG 54 based at Parndorf in Germany between May and December 1943E
An Ergänzungsgruppe was roughly comparable to an Operational Training Unit in the RAF. Although its main role was training, it undertook operational sorties as the need arose. The commander of IV./KG 54 at this time was Major Helmut Stamm.



LEFT: A pair of Ju 88 A-4s of I./LG 1 based at Malemes in Crete pictured over the Mediterranean. Note the crude overpainting in black of the national insignia and undersides, intended to make the aircraft less conspicuous during night attacks.



Junkers Ju 88 A-4 of I./LG 1 based at Malemes in Crete between April 1942 and January 1943
Apart from the temporary black paint applied over the national insignia, dirty black patches from the engine exhausts stain the uppersurfaces of the tan (RLM 79) uppersurfaces. During this period I./LG 1 was led by Major Joachim Helbig, one of the Luftwaffe's most famous bomber pilots.

cruisers, and 24 destroyers provided the escort while a fourth carrier accompanied the convoy part of the way laden with 38 Spitfires for delivery to Malta.

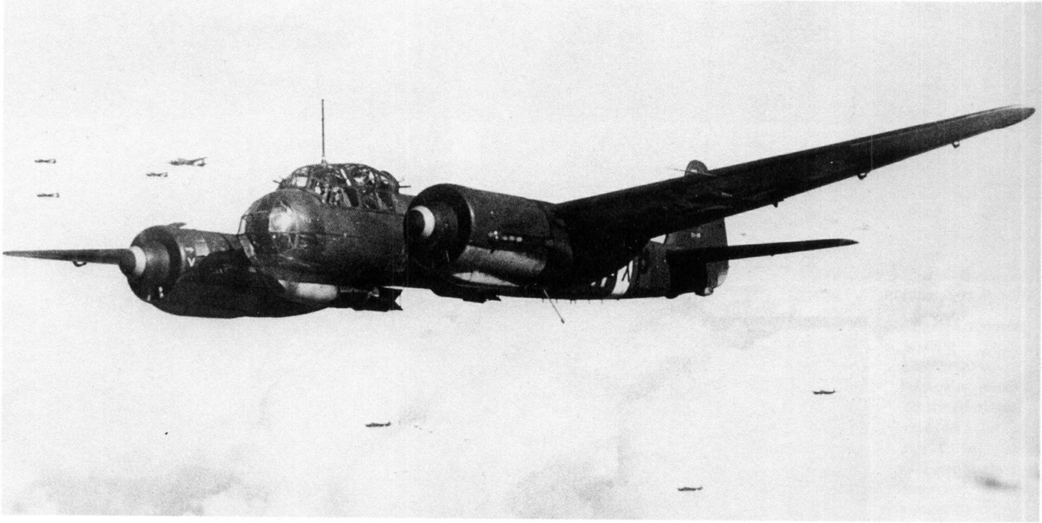
On 10 August the huge convoy was spotted soon after entering the Mediterranean, and the *Luftwaffe* girded its response. Among the reinforcements sent to the central Mediterranean area were 28 Ju 88s from I. and II./LG 1 from Crete. With the *Luftwaffe* long-range bombers already in the area, drawn from I./KG 54, II. and III./KG 77, KGr 606 and KGr 806, there was a total of 130 Ju 88s in position to attack the concentration of ships. Those Ju 88s were only part of the Axis strength arrayed against the convoy, however. Also committed were 73 Italian torpedo bombers, 49 Italian long-range bombers, and 49 Ju 87 dive-bombers flown by Italian and *Luftwaffe* crews.

Operation 'Pedestal' cost the Royal Navy one aircraft carrier, two cruisers and a destroyer sunk, and one carrier, two cruisers and three destroyers seriously damaged. Only five freighters out of the 14 that set out reached Malta. The 32,000 tons of supplies they brought to the island was somewhat less than had been hoped, but they would be sufficient to sustain the island for a few more months. And before that time expired, major changes in the Allies' fortunes in the Mediterranean would bring an end to the siege. Never again would Malta face the peril she suffered at the beginning of August 1942.

A Successful Operation by I./LG 1

Luftwaffe aircraft flew regular maritime reconnaissance missions over the eastern Mediterranean, and shortly after noon on 11 May one of these aircraft sighted four Royal Navy destroyers making a sortie from Alexandria. *Jervis, Jackal, Kipling* and *Lively* had set out to attack an Axis convoy that had left Italy and was heading for Benghazi in Libya.

Hptm. Joachim 'Jochen' Helbig led 14 Ju 88s of I./LG 1 off the ground from their base at Heraklion in Crete. During the mid-afternoon they located the destroyers and delivered a series of diving attacks. One bomber scored a direct hit and a very near miss on the *Lively*, and she sank minutes later. A follow-up attack by II./LG 1 a few hours later was unsuccessful. Then, late in the afternoon, Helbig returned with I./LG 1 and delivered another attack, which sank *Kipling* and inflicted such heavy damage on *Jackal* that she sank the next morning. Only *Jervis* survived the onslaught, and she returned to Alexandria carrying 630 survivors from the other destroyers.



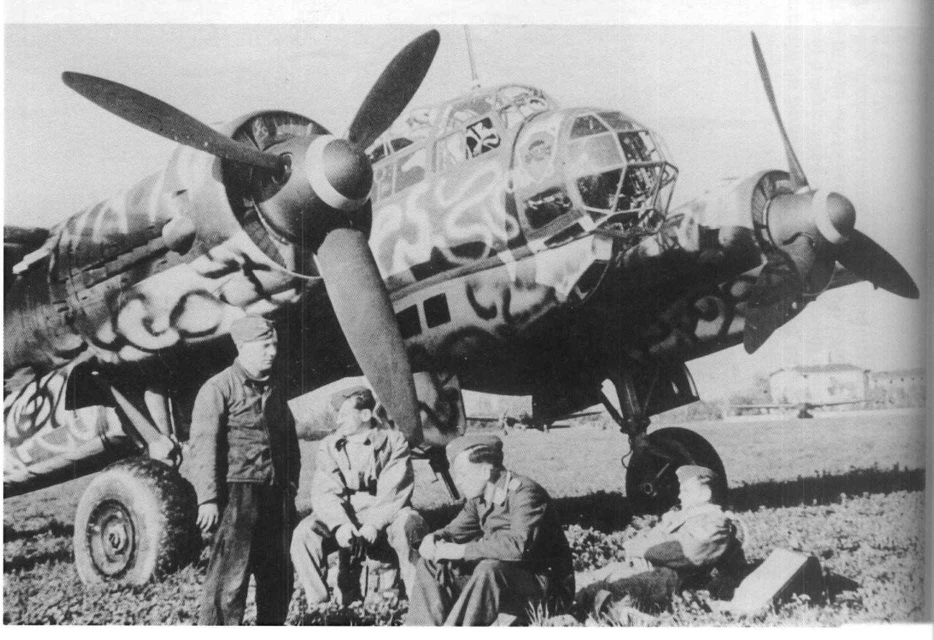
RIGHT: Bomb-laden Ju 88 A-4s of 6./KG 54 en route from Catania, Sicily, to attack Benghazi in Libya in the autumn of 1942 following its capture by British and Commonwealth forces.

Bombers over the Eastern Mediterranean

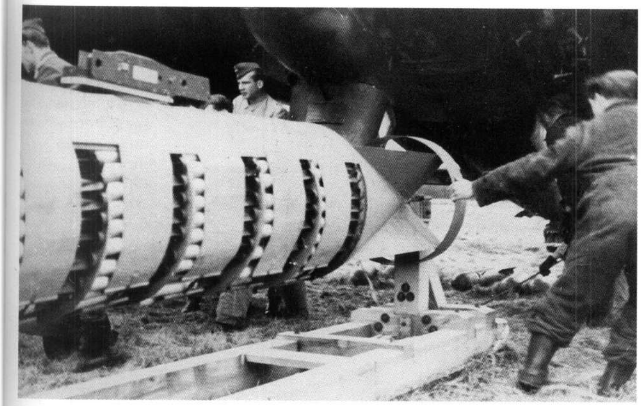
Due to its long-running shortage of aviation fuel in North Africa throughout 1942, resulting from the Allied air and naval blockade, the *Luftwaffe* was unable to base long-range bomber units in Egypt or Libya permanently. The nearest *Luftwaffe* bomber base to the battle areas in Egypt or Libya was at Heraklion on Crete some 320 km (200 miles) from Tobruk and 560 km (350 miles) from El Alamein, home of the Ju 88s of I./LG 1 and elements of I. and III./KG 54. Other bomber units were based at airfields in Greece.

For much of the time the *Luftwaffe* long-range bombers in this area mounted a campaign to mine

ABOVE: The crew compartment of a Ju 88. The proximity of the crewmembers' positions made for a high degree of crew co-operation.

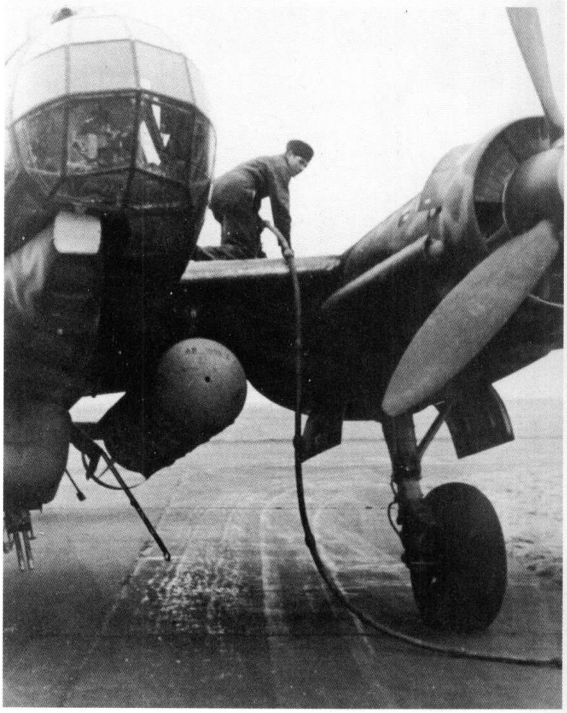


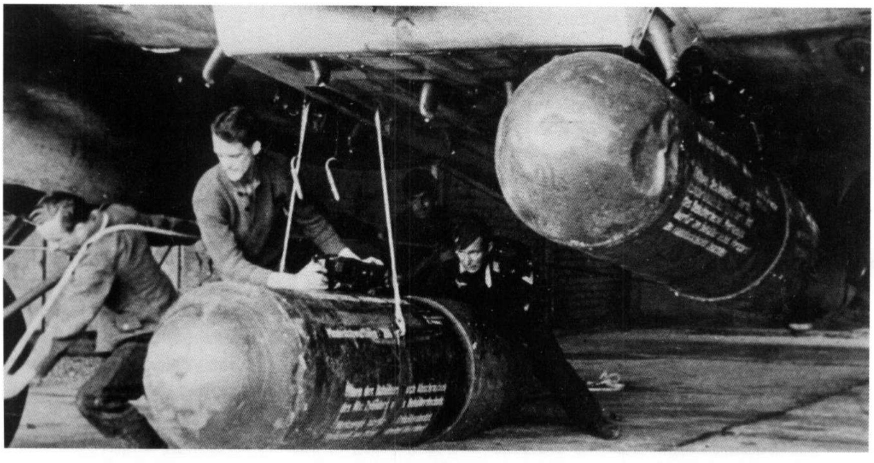
RIGHT: A Ju 88 A-4 of KG 54 pictured at Bergamo in Italy bearing the unusual wave mirror camouflage scheme. This scheme proved to be most effective for aircraft flying over water.



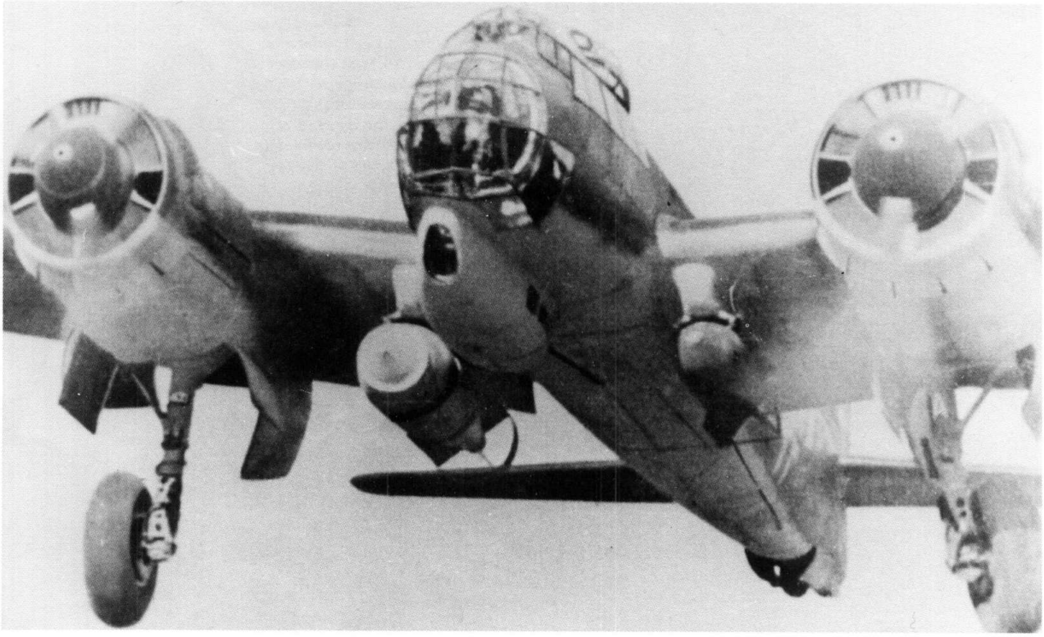
LEFT AND BELOW: Ground crew re-arming and refuelling a Ju 88 in readiness for an attack in the Mediterranean. The weapon under the wing is an AB 1000 container loaded with 620 x 1 kg incendiary bombs. After the container was released from the aircraft over the target, the layers of incendiaries were released at pre-set intervals to produce a series of clusters scattered over a wide area.

RIGHT: Ground crew crank the inertia starter handle to start the starboard engine of a Ju 88 of KG 1, before it sets out on a night attack.





LEFT: Armourers loading LMB 1000 kg parachute mines on the fuselage racks of a He 111. In addition to their intended role of rendering waterways hazardous for shipping, these thin cased weapons were often fitted with impact fuses and employed against land targets. .



LEFT: A Ju 88 pictured immediately after take-off for an attack mission. The port undercarriage unit is in the process of retracting and has started to turn through 90 degrees so the wheel can lie flat in the nacelle. The retraction of the tail wheel is almost complete. The aircraft carries an SC 1000 bomb on the starboard side and an SC 250 on the port side, and its outer bomb carriers have been removed.

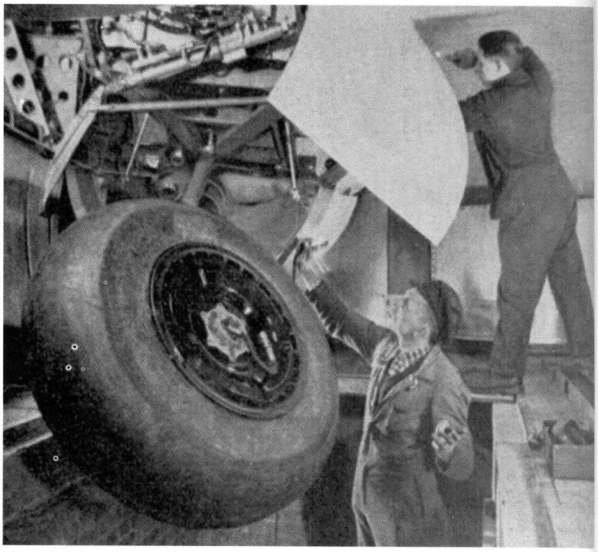
the waters off the naval base at Alexandria, as well as Port Said and Deversoir, the ports at either end of the Suez Canal and the canal itself. Also, the Ju 88s provided air cover for Axis convoys plying between Europe and North Africa, in an effort to reduce the losses suffered during attacks by British aircraft and submarines.

On the night of 23 October 1942 Allied troops, supported by a huge artillery bombardment, launched their long prepared offensive at El Alamein in Egypt. First of all the troops had to carve safe lanes through the dense German and Italian minefields, however, and initially they made slow progress.

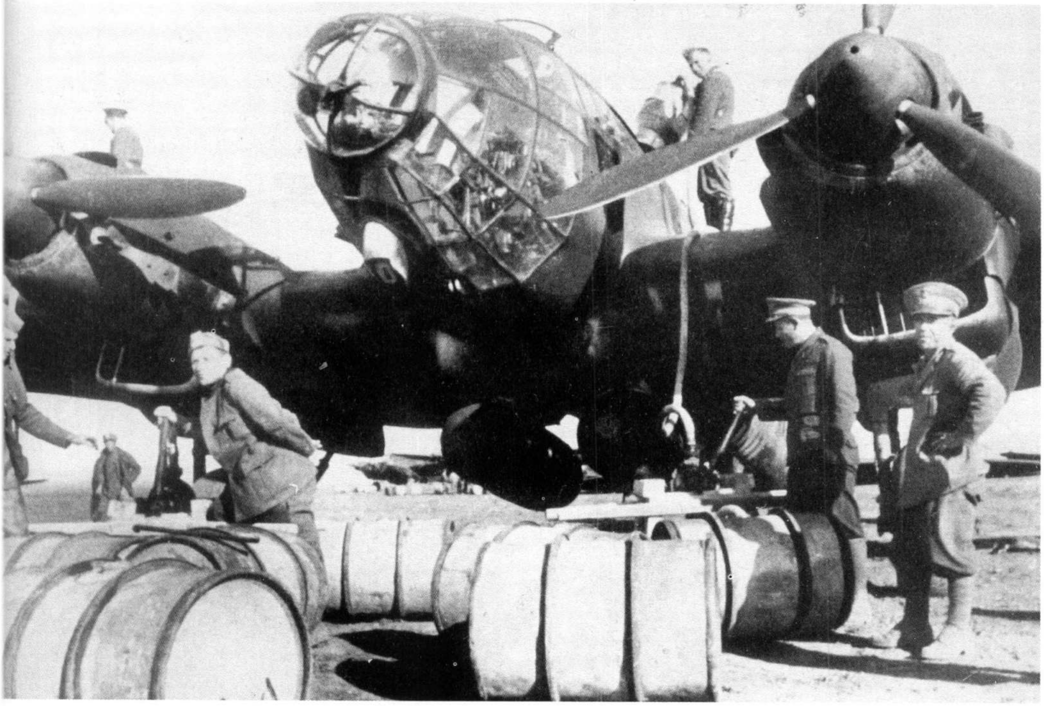
On the second night of the offensive some 12 Ju 88s flew from airfields in Greece and Crete and put down at the forward landing ground at Sidi Haneish. There the aircraft were loaded with bombs and, after a briefing on the ground situation, they took off to attack targets in the battle area. After delivering their attacks, the Ju 88s returned to their bases.

That night the Ju 88s arrived over the battle area to find the British 8th Armoured Brigade formed up in single file, ready to pass through a narrow gap that had been cleared through a minefield. One Ju 88 attacked a long column of vehicles and scored a lucky hit on a petrol tanker, which burst into flames. The resultant glow attracted German artillery fire as well as further bomber attacks, until about 25 vehicles were ablaze several of which carried fuel or ammunition. The resultant fires and explosions halted the British advance at that part of the front, until they burned out some hours later.

In the full pattern of events it was a relatively minor incident, however. After ten days of hard fighting the Axis front collapsed, and the German and Italian troops began a long retreat to the West. Although they made valiant attempts to halt the Allies, the latter pushed ahead until the Axis forces were pushed out of Egypt and then Libya.



ABOVE: A Ju 88 undergoes an undercarriage retraction test at the factory and shows the main-wheel rotating into its housing behind the engine, under the watchful eye of a technician.



LEFT: Italian airmen at the airfield on Rhodes assist with the refuelling of an He 111 H-6 of KG 4. The aircraft is loaded with a pair of LMB mines, probably intended for the approaches to Alexandria harbour or the Suez Canal.

Invasion of North West Africa – Operation 'Torch'

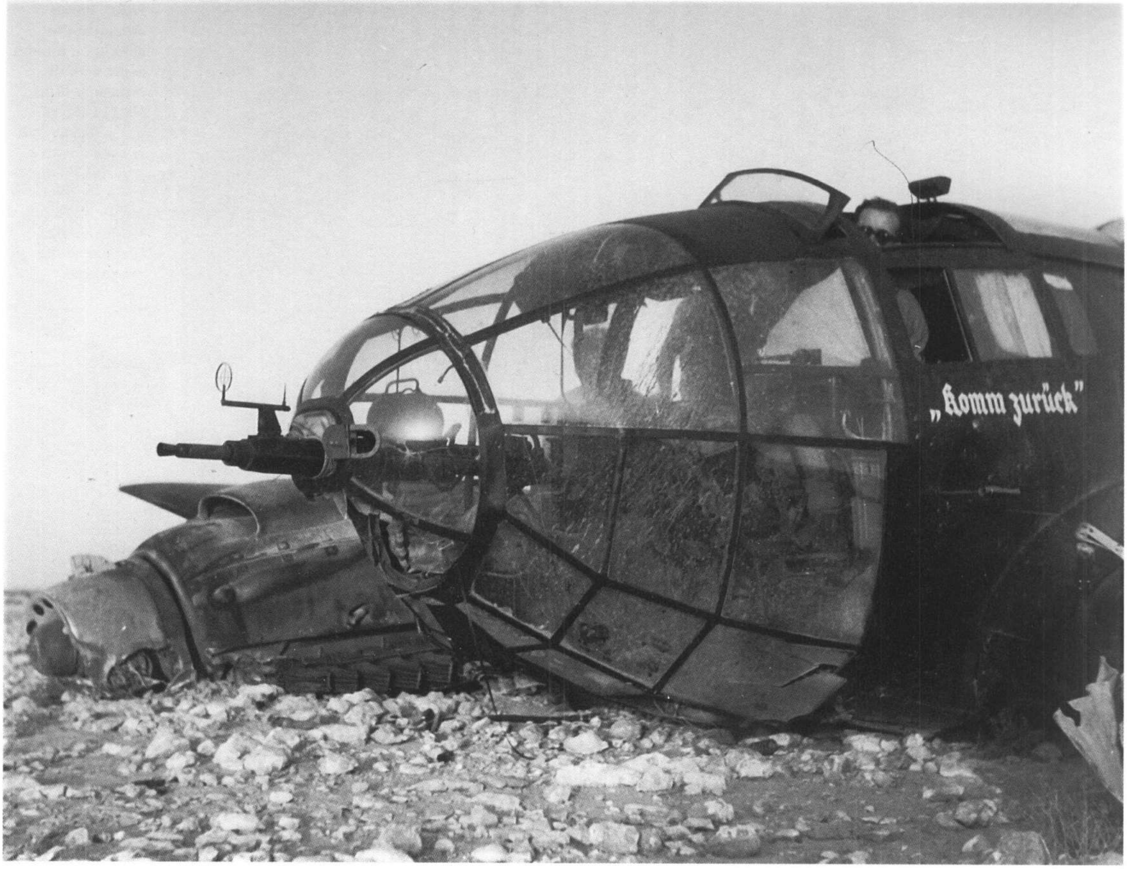
On 8 November 1942, just over two weeks after the launching of the offensive at El Alamein, Allied forces landed in strength on the French African territories of Morocco and Algeria in north-west Africa. Once established ashore, these forces began a slow advance eastward.

In the weeks following the Allied landings, the *Luftwaffe* moved powerful forces to the Mediterranean Theatre from elsewhere. From Norway came 150 bombers and torpedo-bombers, which had been positioned to attack convoys carrying supplies to the Soviet Union. A further 120 long-range bombers came from the central and southern sectors of the Eastern Front. Eventually elements of I. and III./KG 54, I. and III./LG 1, III./KG 26, KG 77 and III./KG 30 were operating in the Theatre. The *Luftwaffe* made no attempt to establish long-range bomber units in Tunisia, however, because this would have incurred supply and maintenance problems. Instead, these aircraft operated against the bridgehead from bases in the south of France, Italy, Sicily and Sardinia.

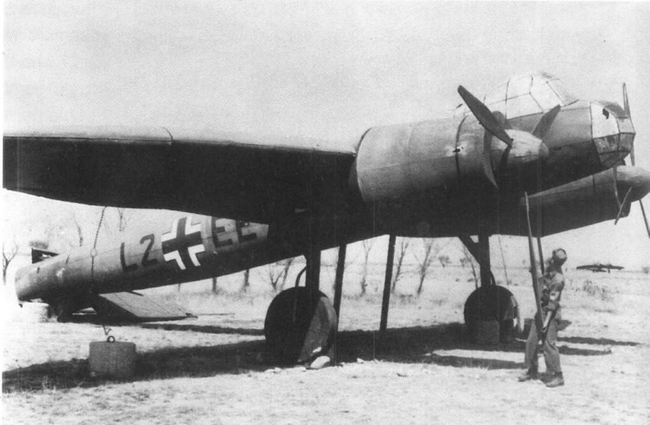
Initially these bombers had some success against shipping at Algiers and convoys moving through the western Mediterranean. Operations to the west of Algiers were limited, however, due to the distances involved. Although airfields were available on the island of Sardinia, due to their lack of facilities they were suitable only as advanced landing grounds.

During November and December 1942 the Allies began using the Algerian ports at Philipeville, Bougie and Bone. These now came under frequent attack from Ju 88s making accurate diving attacks by day, and the destruction of port facilities delayed the build up of Allied forces. The *Luftwaffe* made every effort to sustain these operations on a large scale, but in the face of increasingly effective Allied fighter and anti-aircraft defences, the raiders suffered serious cumulative losses. Moreover, few replacement bomber crews were available, due to the heavy losses incurred on the Eastern Front. As a result many units fell well below their establishment in aircraft and crews, and low serviceability imposed a further brake on operations. After December 1942 the force was able to mount only a relatively low scale of operations, attacking mainly at night with much reduced bombing accuracy.

In a departure from the norm, on the afternoon of 15 January 1943 a force of ten Ju 88s from II./KG 54, I./KG 76 and I./KG 77, with an escort of four Messerschmitt Bf 109s, attempted to attack Thelepte airfield in Tunisia. The airfield was home to the P-40F Warhawks of the US 33rd Fighter Group, and the latter's fighters scrambled in good time. They and the airfield's AA defences engaged the



ABOVE AND BELOW: This He 111 H-6, W.Nr. 7094 coded 6N+FH from 1./KG 100 was brought down in North Africa. The inscription below the pilot cockpit reads "komm zurück" ("come back") which did not bring this crew any luck. Note the rear view mirror fitted to the front of the pilot's sliding hatch.



ABOVE: A plywood replica of a Ju 88 set up at the decoy airfield at Salon in the south of France. These decoys were often used to confuse aerial reconnaissance and Allied aircraft

The Dive Attack in a Ju 88

The Junkers Ju 88 was a fast manoeuvrable bomber, designed to deliver either horizontal or dive-bombing attacks. It was the largest bomber able to perform the latter, giving it a lethal capability against fast moving targets like ships, and pin-point targets such as bridges or fortified troop positions. Until the advent of the guided missile, the steep dive attack was the most accurate practical means of delivering bombs on defended targets.

For the diving attack the Ju 88 flew a programmed manoeuvre. The bomber ran in at an altitude between 3,000 and 5,000 m (10,000 and 17,000 ft), depending on the strength of the AA gun defences at the target. In the floor of the bomber was a small window through which the pilot could observe the target and align the aircraft on it. He then levelled the aircraft precisely, using the artificial horizon. Etched on the floor window was a series of the parallel lines perpendicular to the line of flight, to enable him to judge his distance to the target. Before entering the dive it was important to gauge the strength and direction of the wind, so the bomber's navigator would look out for smoke coming from a ship or rising from fires on the ground that indicated this. If the wind blew strongly from either side, the pilot needed to aim his dive at a position on the upwind side of the target.

Before entering the dive the navigator called out the final checks: throttles back and propellers in coarse pitch, to prevent the engines overspeeding during the dive; the BZA dive-bombing sight, with a reflector glass in front of the pilot's head, was switched on; the target's altitude above sea-level was then set on the audio altimeter. Now all was ready to begin the attack.

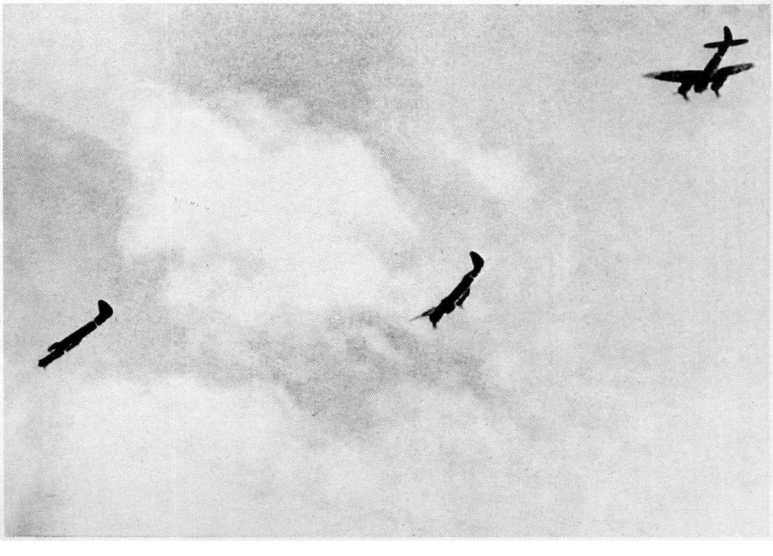
As the target slid under the last of the horizontal lines on the floor window, the pilot pulled the knob to extend the underwing dive brakes. This caused a large nose-down trim change, which lifted the bomber's tail and tilted it into its 60 degree dive. That bunting manoeuvre imposed a negative 'G' loading on the crew and was uncomfortable, though during their training, crews had quickly became accustomed to it.

With the bomber established in its 60-degree dive, the target now appeared on the reflector glass of the dive-bombing sight in front of the pilot's eyes. His task was to fly the aircraft so as to place the illuminated aiming circle over the target, and hold it there throughout the dive. As anyone who has been in a 60-degree dive in an aircraft will testify, such a dive is disconcertingly steep and it feels as if one is going down vertically. To assist in judging the angle the Ju 88 had a series of lines of inclination etched into the cockpit side glass to the left of the pilot's head. Yet with some training, pilots found they were able to judge the correct dive angle to within quite narrow limits 'by eye'.

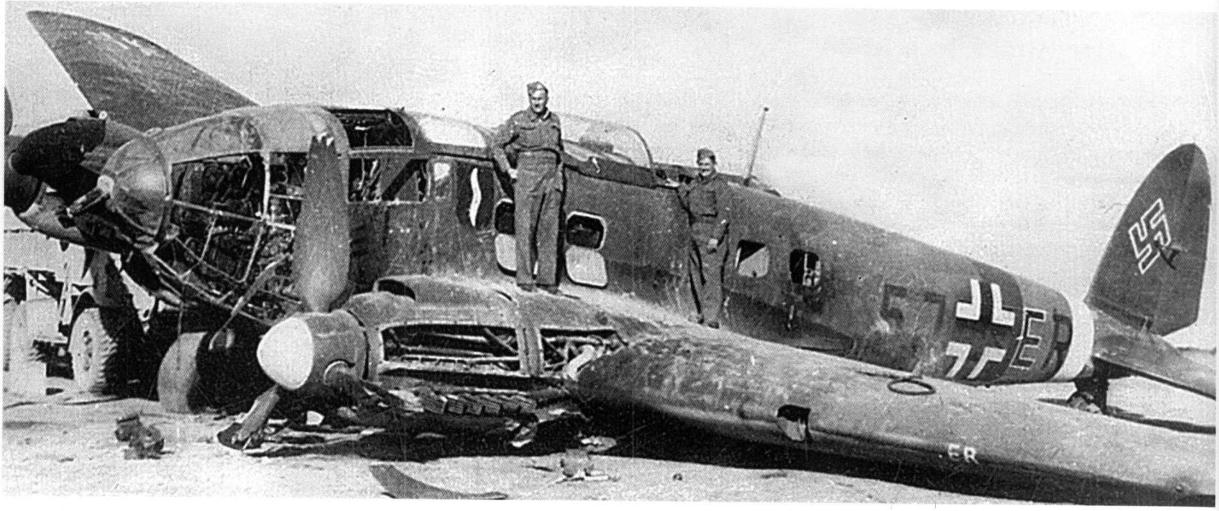
Throughout the dive, the target's defenders would react as violently as they could, and strings of bright tracer usually flashed past the cockpit. This made this form of attack seem more dangerous than it was. *Lt.* Horst von Riesen, who flew Ju 88s with KG 30, told this writer: "At first it seemed that they could not miss us. But in fact we were closing the range very rapidly, and we did not present an easy target. After two or three sorties we learnt the truth of it."

Unless the gunners were actually on the target (for example a warship) they had a difficult deflection shot on the rapidly falling aircraft. If commenced from 3,050 m (10,000 feet), the diving phase of the attack lasted about 15 seconds. By the end of it the bomber had attained a speed of around 580 km/h (360 mph). When the altimeter indicated 1,500 m (4,900 ft) above the previously set target altitude, a warning horn sounded in the cockpit to prepare for bomb release. Four seconds later, the bomber reached 1,000 m (3,300 ft) and the horn's blast ceased. That was the signal for bomb release, and the pilot pressed the release button on the control column. As the bombs left the aircraft, an automatic mechanism placed the elevators in the up position. That brought the bomber's nose up and pulled it firmly out of the dive. At the end of the manoeuvre the aircraft was in a slight climb. The pilot now retracted the dive brakes, selected fine pitch on the propellers, and pushed open the throttles.

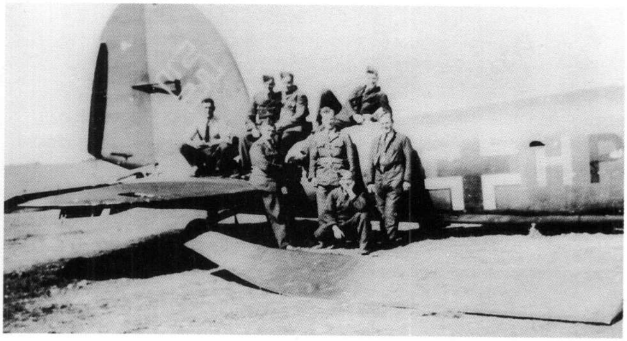
As the Ju 88 was recovering from the dive, it was at its most vulnerable to return fire. When attacking well-defended targets, crews would often continue at low altitude to make their escape 'on the deck', weaving from side to side as they made their getaway:



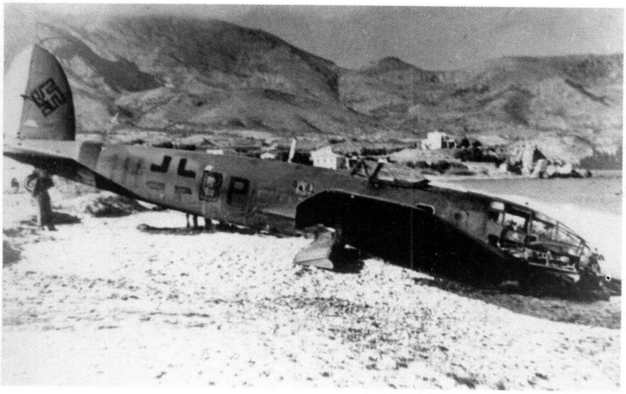
RIGHT: This photograph taken from another aircraft shows three Ju 88s in a diving attack. The Ju 88 had a far greater range than the Ju 87 'Stuka' which made the aircraft more suitable to attack shipping in the Mediterranean at greater distances.



ABOVE AND BELOW: Two more He 111s left behind by the Luftwaffe in North Africa. *ABOVE:* This He 111 belonged to 7./KG 4, Kampfgeschwader 'General Wever' and was coded 5J+ER. Note the unit emblem on the left of the Allied soldier standing on the wing. *BELOW:* A group of Allied soldiers pose in front of the wreck of an He 111 coded G1+HP of 6./KG 55 'Greifen-Geschwader'.



BELOW: This He 111 from 6./KG 26, coded 1H+BP, made an emergency landing on the Spanish coast. Note that the usual white outline to the fuselage cross, swastika and the fuselage band have been overpainted in black for night operations.



The LT 350 Circling Torpedo

To permit attacks on convoys at sea or ships in harbour, the Italian Air Force developed a circling torpedo, the *Motobomba*. This weapon was also introduced into the *Luftwaffe*, where it was designated the LT 350. The weapon weighed 360 kg (just under 800 lbs). Usually released from below 300 m (1,000 ft), the weapon descended by parachute. On hitting the water the parachute was released, the electric motor started and the weapon headed off on an ever-widening circular path. Running at 70 km/h (40 knots) at a depth of 3 to 4 m (10 to 13 ft), it sought out a target for its 120 kg (265 lb) warhead. The weapon had an endurance of about 20 minutes, after which it self-destructed.

A serious disadvantage of the conventional torpedo as an air-launched anti-ship weapon was that crews needed lengthy and specialised training in the role if they were to be effective. This meant that during most of the period under review only a single under-strength *Geschwader* - KG 26 - was able to mount torpedo attacks. The advantage of the LT 350 was that it was dropped like an ordinary bomb, and required no specialised training for the crews involved nor specialised modifications to the aircraft. A Ju 88 could carry either two or four of these weapons, depending on the fuel load necessary for the mission.

During the spring of 1943, the Ju 88s of KG 54 and KG 77 took part in a series of night attacks on harbours using LT 350s: against Tripoli on 19/20 March, Algiers on 26/27 March, Tripoli again on 13/14 April and against Bône on 16/17 April. About 200 circling torpedoes were expended during these operations, without achieving any successes. In a later operation, the LT 350 would do much better, but that occurred outside the time period covered in this account.

raiders to great effect, with the result that nine out of the ten Ju 88s were shot down. The *Luftwaffe* did not attempt to repeat this form of attack.

As the Axis supply situation in Tunisia became more tenuous it became necessary to employ operational bomber aircraft, Ju 88s and He 111s, to transport fuel across the Mediterranean. During a typical operation of this type, on 8 April 1943, Ju 88s flew 41 sorties to convey 51 tons of fuel to airfields in North Africa. The bombers carried the extra fuel in ferry tanks in the bomb bay and under the inner wings, which were drained into a tanker when the aircraft reached its destination. It was an expensive way to transport fuel, however, for depending on the distance flown the bomber consumed between a quarter and a third of the fuel it delivered.

As the spring of 1943 neared its end, the situation facing Axis forces in Tunisia deteriorated sharply. Allied ground forces imposed severe pressure on the beleaguered Axis from both the East and the West, while the steadily strengthening Allied air forces in the area brought to bear overwhelming power. By now the latter had achieved a high degree of air superiority, which slowly throttled the Axis air and sea supply routes. The end was only a matter of time, and on 13 May 1943 the last of the Axis forces in Tunisia surrendered.

Now the Allies held the whole of the North African coast. That area and Malta became springboards, as preparations began to launch another major amphibious operation against the Axis: against the island of Sicily.

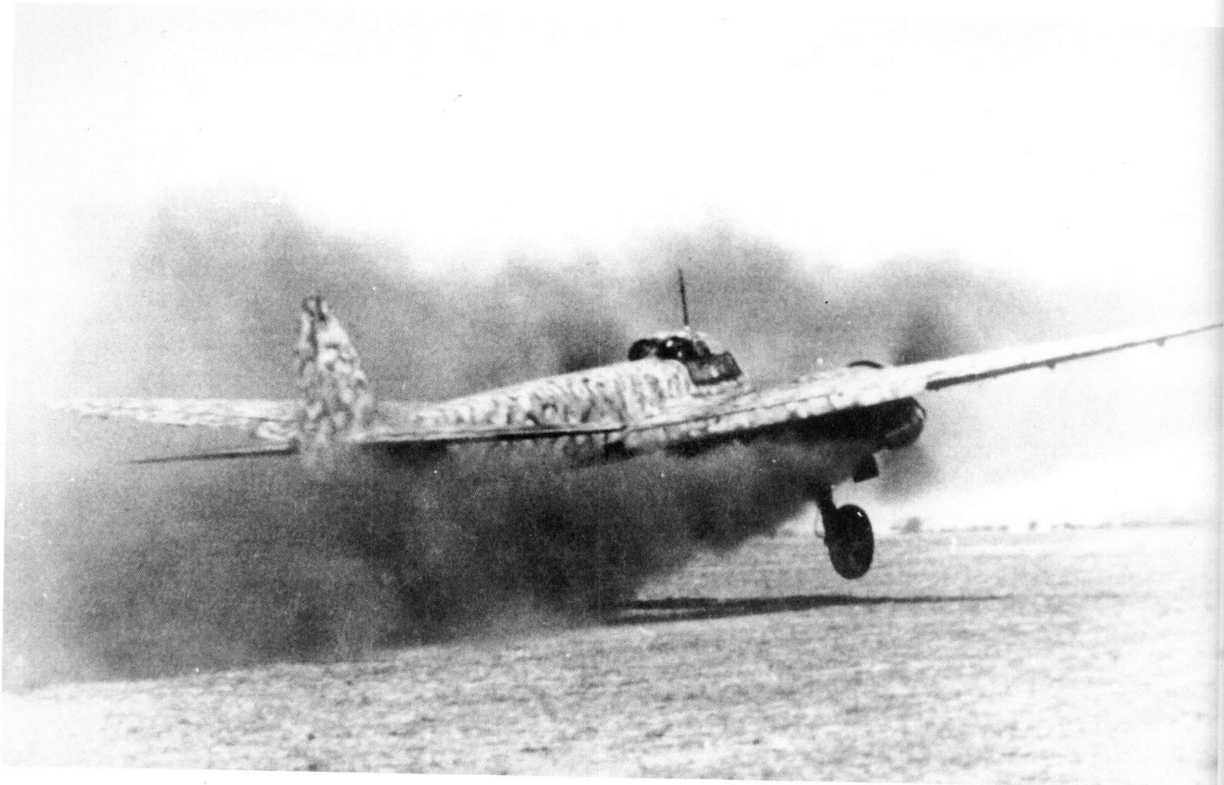
The Invasion of Sicily – Operation 'Husky'

On 10 July 1943, preceded by an intensive bombing campaign against airfields in the area, Allied troops with strong naval and air support landed on Sicily. To cover the entire Mediterranean Theatre *Luftflotte* 2 possessed 14 *Gruppen* of bombers, comprised I./LG 1, I. and III./KG 1, I. and III./KG 6, III./KG 30, III./KG 54, I. and II./KG 76, and III./KG 77 – equipped with Ju 88s, while I. and III./KG 26 operated He 111s and II. and III./KG 100 were equipped with Do 217 E-5s and K-2s. II./KG 26, with He 111s was equipped to drop torpedoes.

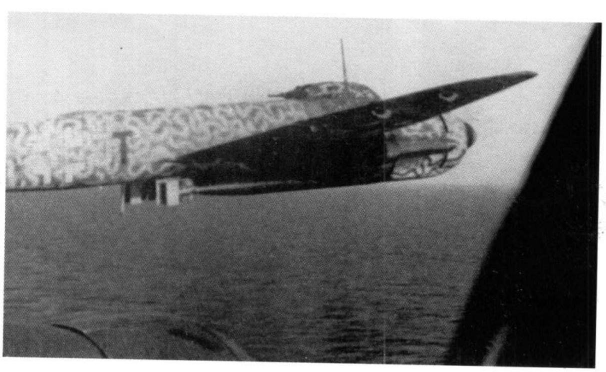
Thanks to an effective Allied programme of deception operations, which indicated that the assault might take place in the south of France, on Sardinia or on Greece, initially there were few long-range bomber units positioned to engage the landings.

Only on the day following the landings did the *Luftwaffe* make any serious attempt to intervene. Ju 88s tried to fight their way through to the beachhead, but due to the strength of the Allied air patrols they suffered serious losses and secured no worthwhile result. Thereafter the *Luftwaffe* long-range bomber force restricted its efforts to the period between dusk and dawn, leaving the fighting during the daylight hours to the fighter-bomber units.

ABOVE AND LEFT: Two photographs of an He 111 of KG 26 loaded with two torpedoes ready for action.



ABOVE AND RIGHT: Using rocket assisted take-off engines this torpedo-carrying Ju 88 from I./KG 77 takes off on a mission over the Mediterranean.



ABOVE: This Ju 88 coded 3Z+UT from 9./KG 77 is flying at low level above the water loaded with two torpedoes

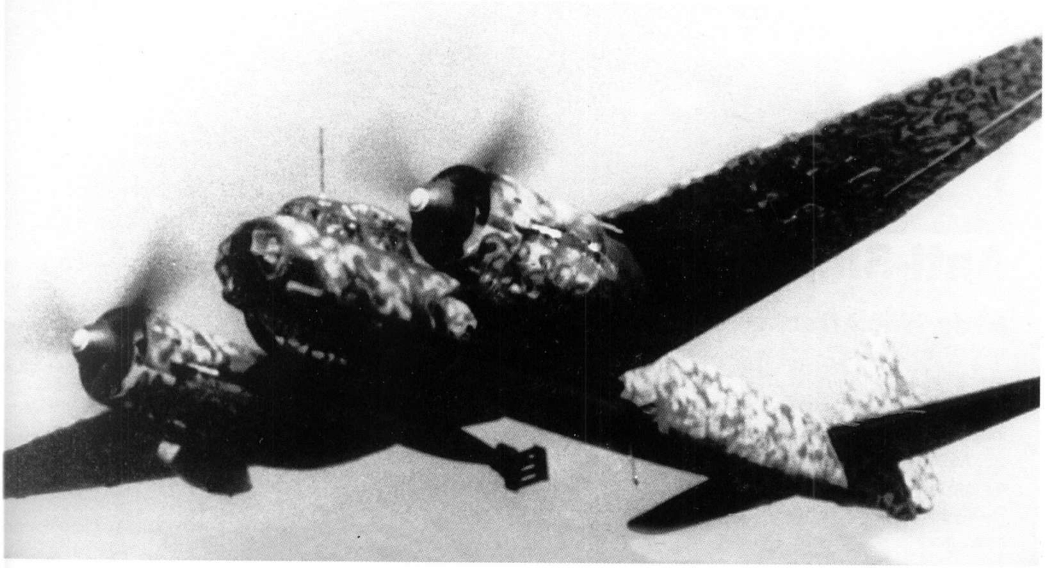
The Invasion of Salerno, Italy: Operation 'Avalanche'

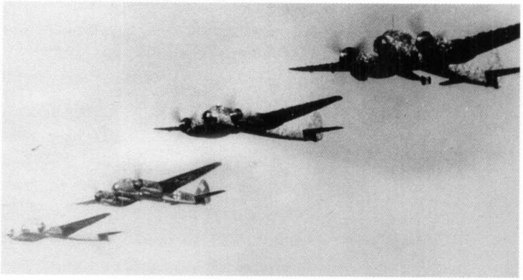
Preceded by a series of heavy raids on airfields in Italy and Sardinia, early in September 1943, Allied amphibious forces prepared to land at points on the Italian mainland. A *Luftwaffe* reconnaissance aircraft located one of the invasion convoys off the coast of North Africa. On the night of 2nd/3rd, about 35 long-range bombers attacked the ships but without success.

On 3 September British troops landed with little opposition at Reggio on the toe of Italy, the mainland town nearest to Sicily. That was only a prelude however, to the far larger and more important landing at Salerno just south of Naples, about 225 km (140 miles) to the north, scheduled for a few days later.

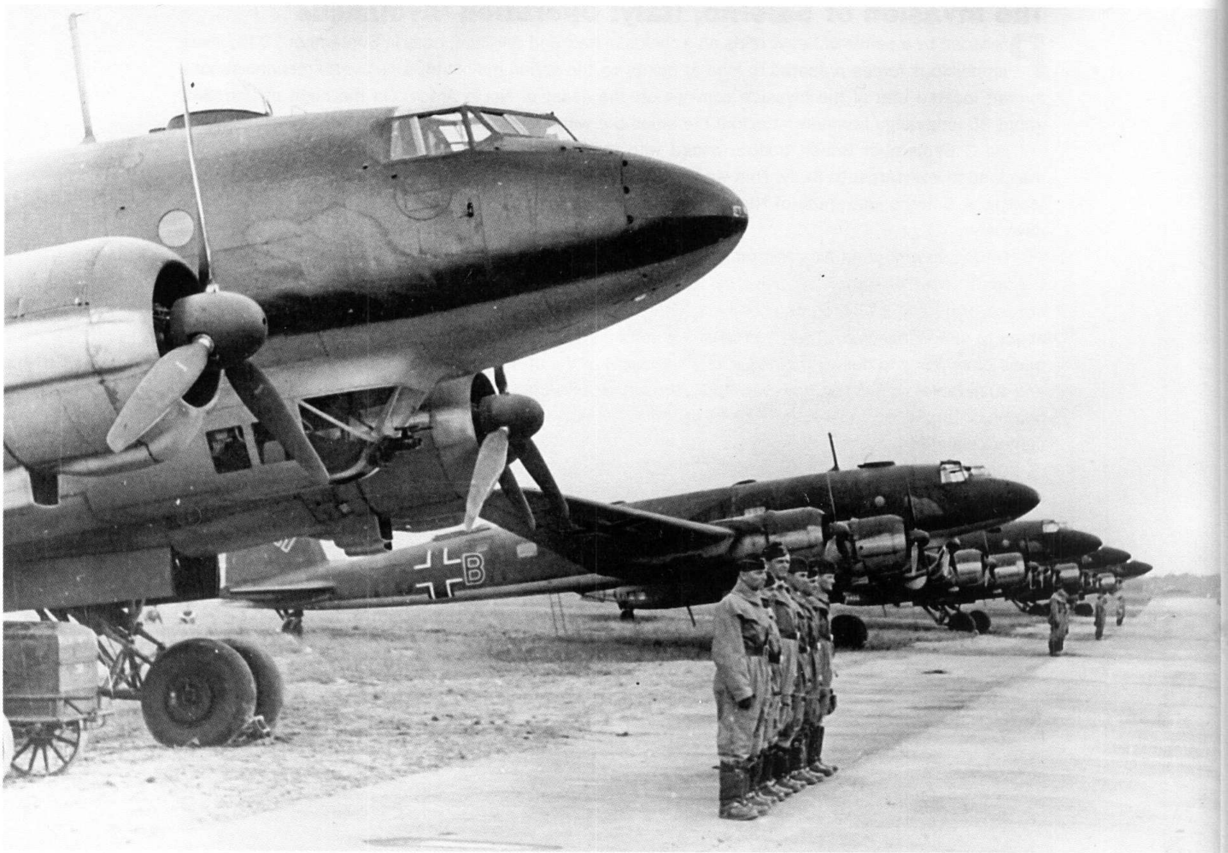
On 8 September an Axis reconnaissance aircraft sighted one of the invasion convoys heading for the west coast of Italy. That night the *Luftwaffe* launched a large air strike involving 158 bomber sorties, including 25 by torpedo-bombers. First, Ju 88s of KG 26 dropped flares along one side of the ships to silhouette them. Then bombers and torpedo-bombers swept in from the opposite side of the mass of shipping to deliver their attacks. The weight of the attack fell on warships rather than the slow and vulnerable transports, however. And although several craft suffered hair-raising near misses from bombs or torpedoes, no warship was hit. During that action the ships' guns and escorting Allied night fighters claimed the destruction of 18 raiders.

On the following day, 9 September, Allied troops landed at Salerno and the Italian government announced its surrender. Under the terms of the armistice, it had been agreed that the main body of the Italian battle fleet was to sail to Malta to surrender. The ships set out, but on the way they came under attack from Dornier Do 217s of III./KG 100, whose radio-guided bombs sank the battleship *Roma* and damaged her sister ship the *Italia*. A detailed description of this operation is given in the next Section.





ABOVE AND RIGHT: These Ju 88s from I./KG 77 appear to be returning to their base at either Gerbini or Piacenza from a mission over the Mediterranean. The two aircraft nearest to the camera appear to carry a meandering 'wave' type camouflage scheme on their upper and lower surfaces which has also been applied over the fuselage Balkenkreuz, while the third machine has a standard two-tone finish. The machine nearest the camera *ABOVE,* still has its two LT 5Fb torpedoes attached, which might indicate that the weapon failed to release, in which case the pilot would have to make a hazardous landing with them still attached.



ABOVE: Fw 200 C-3s of KG 40 and their crews on parade. Note that the unit emblem of the 'World in a Ring' has been painted out on the nose of the nearest aircraft.

Anti-Shipping Operations

Early War Attacks

ABOVE: A Focke-Wulf Fw 200 of KG 40 returning from a mission has just landed at Bordeaux-Merignac. Ground personnel are gathering to take charge of servicing the aircraft for the next mission.

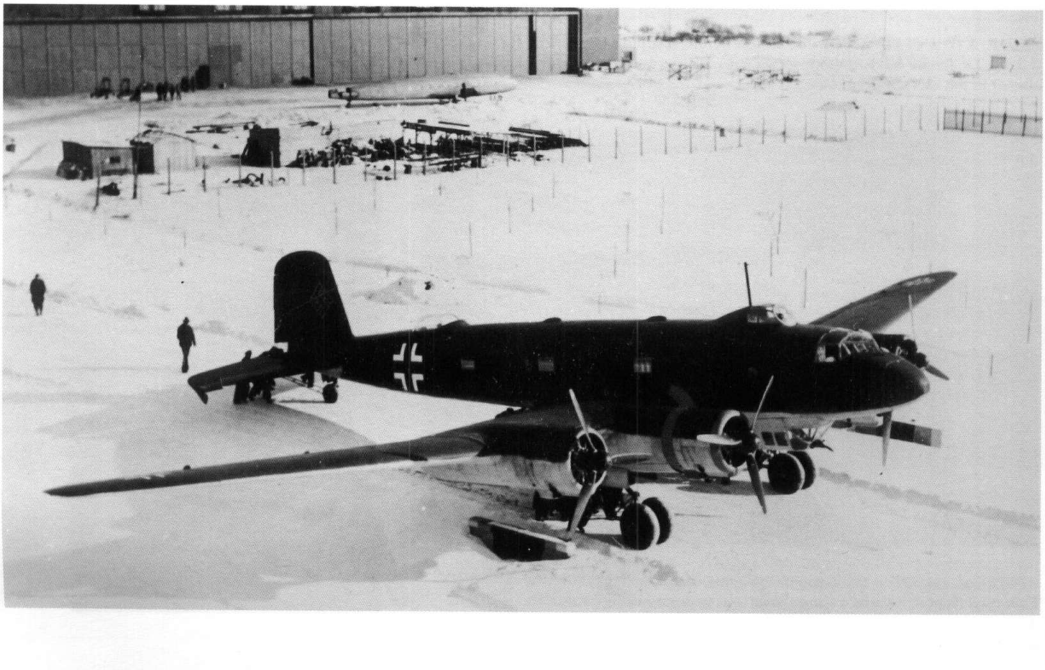
This Section confines itself to the operations of the specialised anti-shipping units as opposed to operations against shipping carried out by regular long-range bomber units, and minelayers.

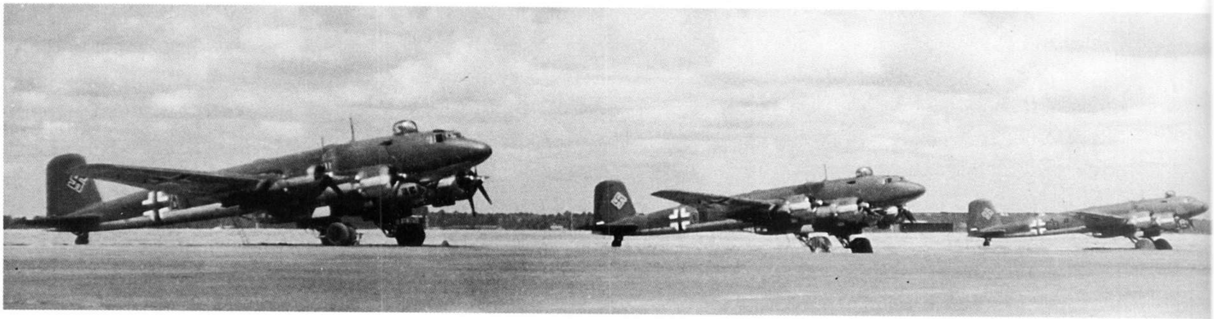
As described in Volume Two of this series, during the early part of the war the four-engined Focke-Wulf Fw 200 Condors of KG 40 achieved considerable success in anti-shipping operations. The type's successes went far beyond the quality of the aircraft as a bomber, or the limited numbers of them in service. Initially the majority of Allied merchant ships carried little or no defensive armament to counter-attacking aircraft. That allowed the Fw 200s to make deliberate attacks on individual ships from very low altitude. The pilot released the bombs 'by eye' and had a good chance of achieving one or two hits with a stick of five bombs.

For the Condor crews it was all too good to last. By the early months of 1942 most merchant ships carried short-range AA weapons, while the numbers of warships escorting each convoy rose steadily. Life became increasingly dangerous for the Fw 200 crews, and their losses rose. They were forced to cease their low-altitude attacks on merchant ships, and shifted to the purely maritime reconnaissance role.

LEFT: The Focke-Wulf Fw 200 Condors of KG 40 flew lengthy missions over the Atlantic, plying between Bordeaux/Merignac in France and Stavanger/Sola in Norway, in their search for Allied shipping and convoys. Initially the Royal Navy was desperately short of escort vessels, and these aircraft were able to attack convoys with little risk to themselves.

RIGHT: A newly-built Fw 200 C-1 being rolled out in the snow at the Focke-Wulf factory in Bremen ready for a test flight.

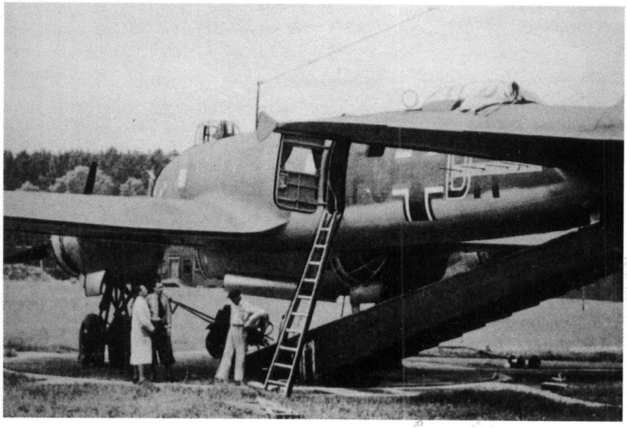




ABOVE: A line-up of late model Fw 200 C-4s at Stavanger/Sola in Norway.

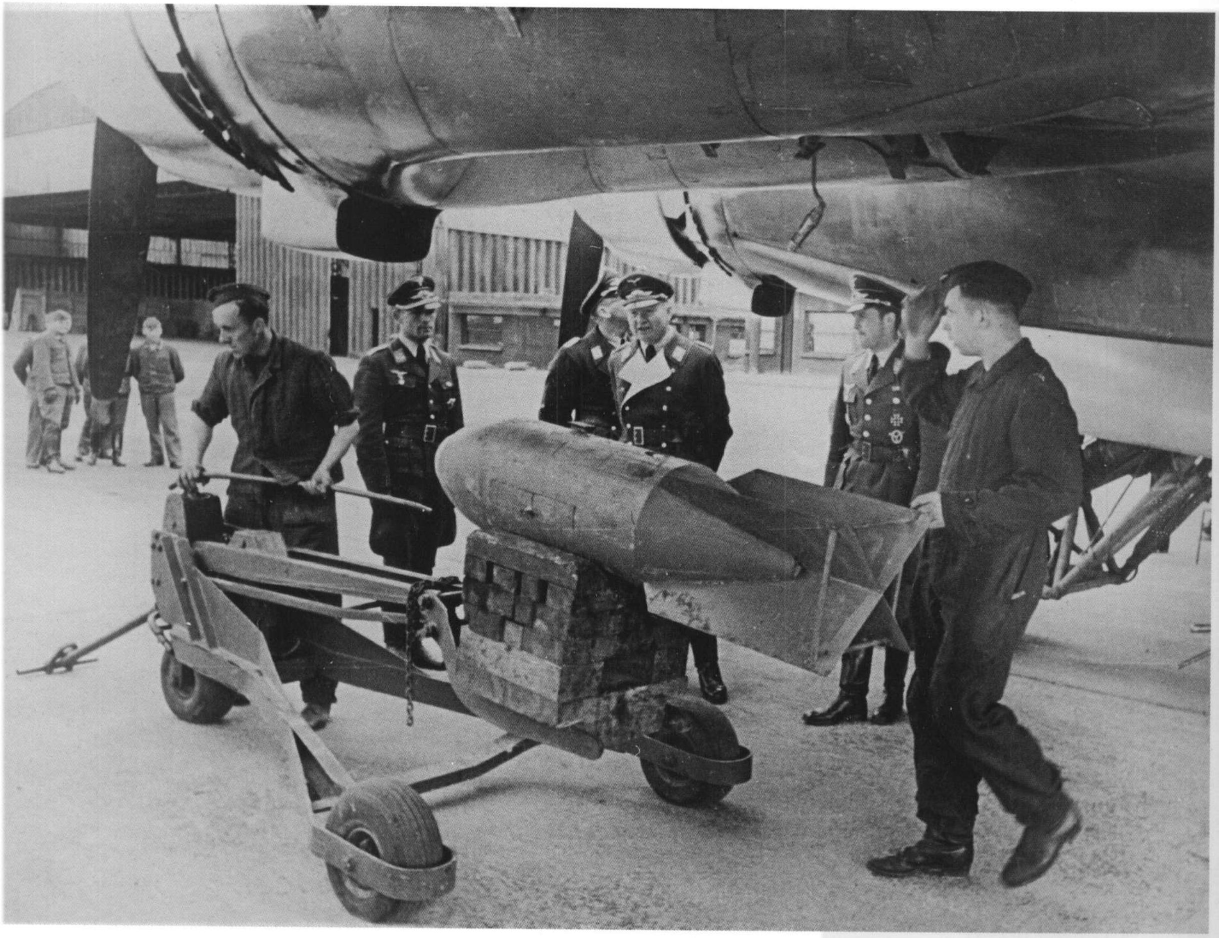
ABOVE: A crew of KG 40 dons life jackets before boarding the Fw 200 for an over-water mission. On the far left is Hauptmann Bernhard Jope, one of the leading exponents of this aircraft in the anti-shipping role.

ABOVE: Robert Kowalewski pictured at the controls of an Fw 200

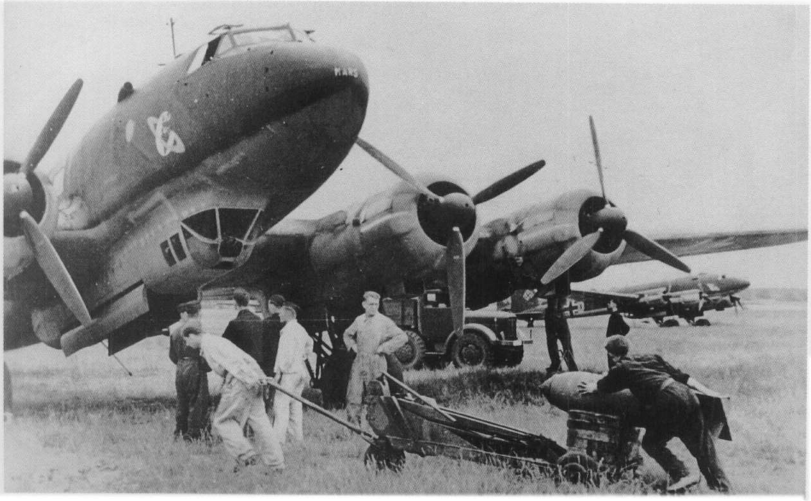


ABOVE: An Fw 200 on the compass swinging base. The transmitting aerials for the little used Neptun S surface search radar can be seen just in front of the tailplane.

LEFT: Major Robert Kowalewski had a distinguished career in the anti-shipping role flying He 111s with KG 26. He was awarded the Ritterkreuz in May 1940. In August 1941 he moved from his position as Kommandeur of II./KG 26 to take command of III./KG 40 equipped with Fw 200s. During the closing stages of the war he flew Ar 234s with KG 76.

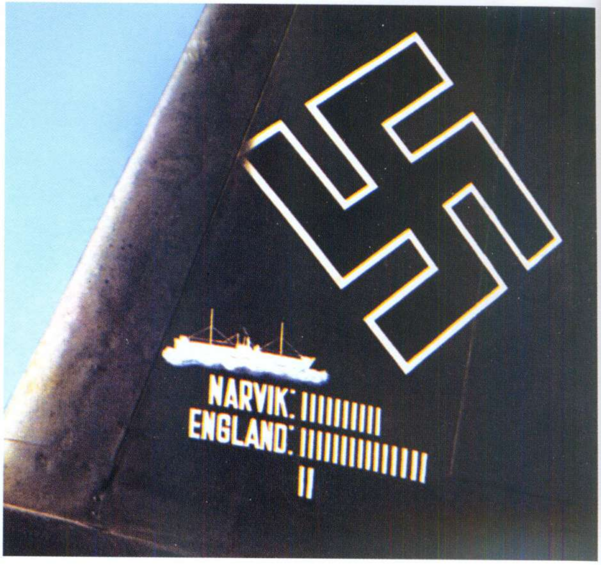


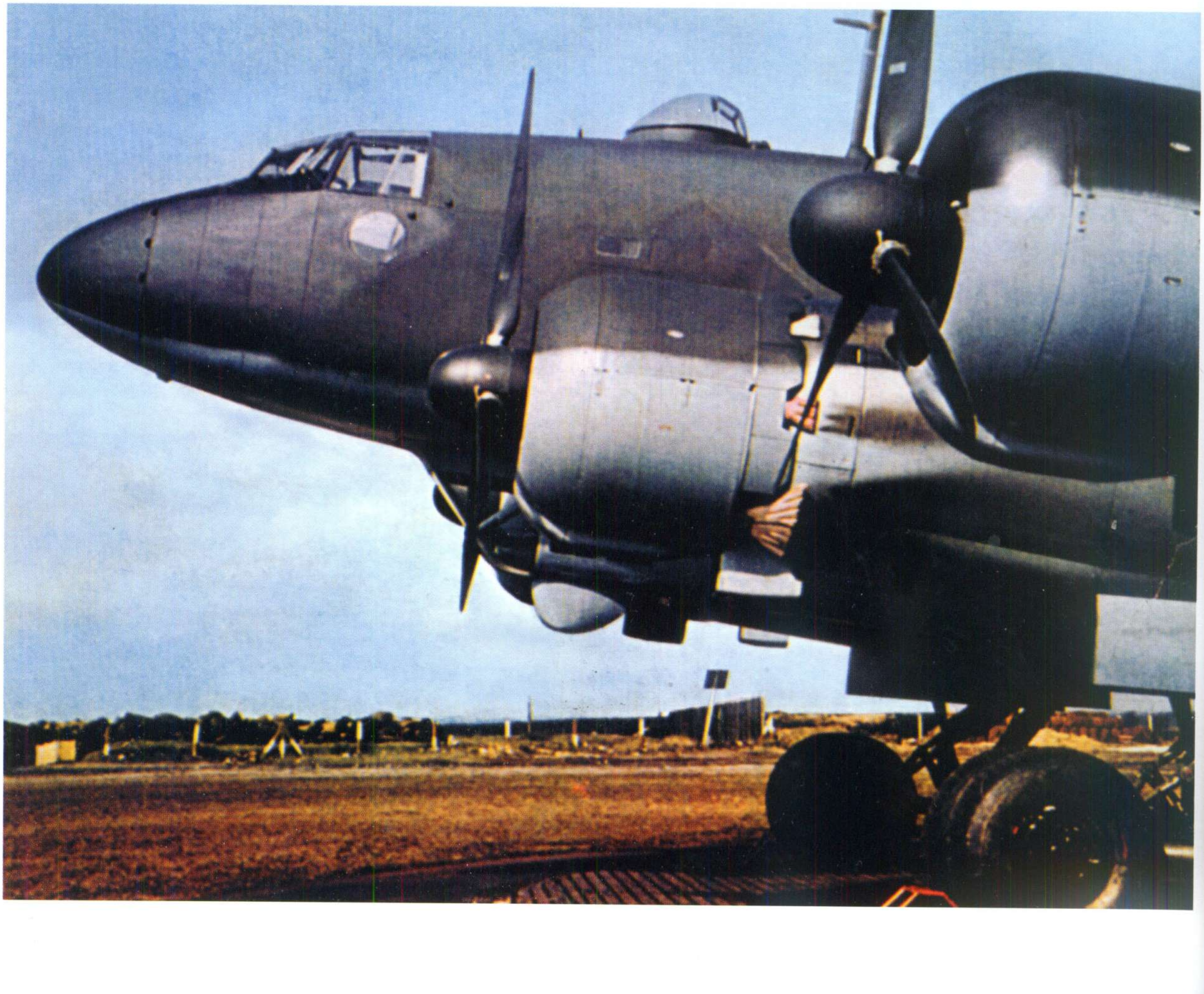
ABOVE AND BELOW: Armourers load SC 250 bombs on Fw 200s of KG 40 at Bordeaux-Merignac. Note the unit's emblem, the 'World in a Ring' painted on the side of the fuselage aft of the cockpit..

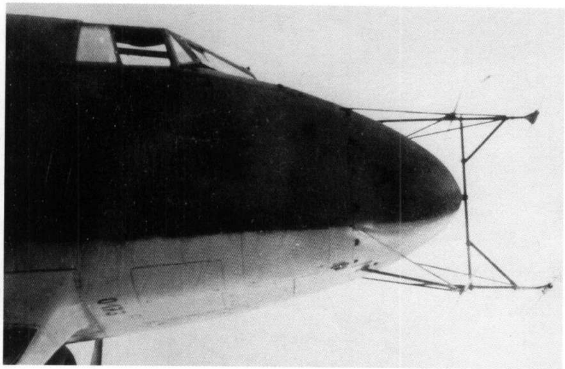


ABOVE: An Fw 200 pictured in a blast pen, probably at Bordeaux-Merignac. The aircraft's code letters were F8+CH, though the 'F' appears to have been a crude modification of the 'K' which formed part of the machine's delivery call sign and which still shows through.

THIS PAGE AND OPPOSITE: This series of colour photographs was taken for propaganda purposes and was published in a wartime book on the Luftwaffe called 'Fliegende Front'. The photographs show Fw 200 aircraft and crews of KG 40 based at Bordeaux-Merignac. All the aircraft have had their 'World in a Ring' unit emblems painted out, probably as part of a censorship precaution.

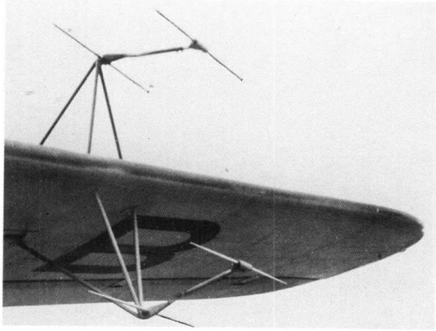


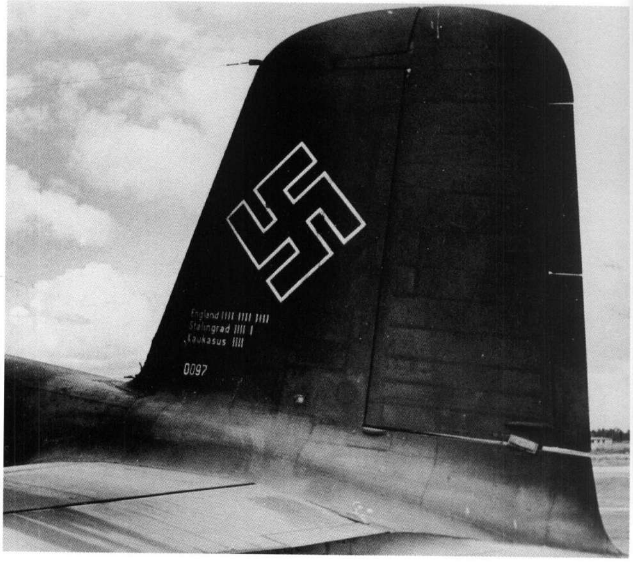




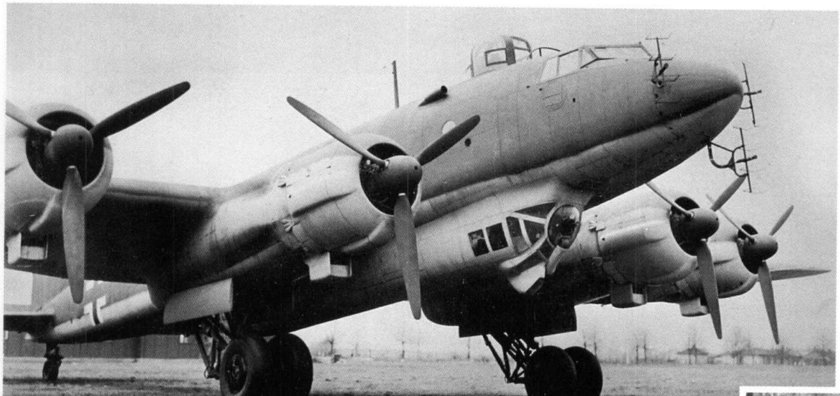
ABOVE: The nose-mounted transmitter aerials of the Rostock radar fitted to an Fw 200.

RIGHT: The wing mounted receiver aerials of the Rostock radar.



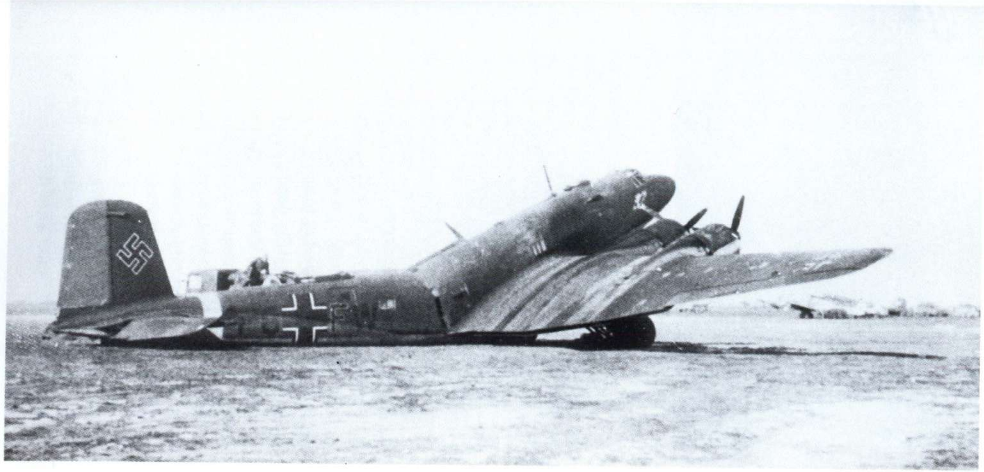


ABOVE: A mission tally painted on the tail of an Fw 200, listing twelve sorties against England, five to supply Stalingrad and four to carry supplies to German troops in the Caucasus area.

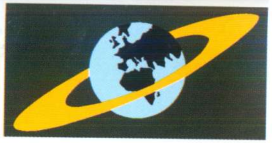


ABOVE: An Fw 200 C fitted with nose-mounted aerials for the Hohentwiel surface search radar.

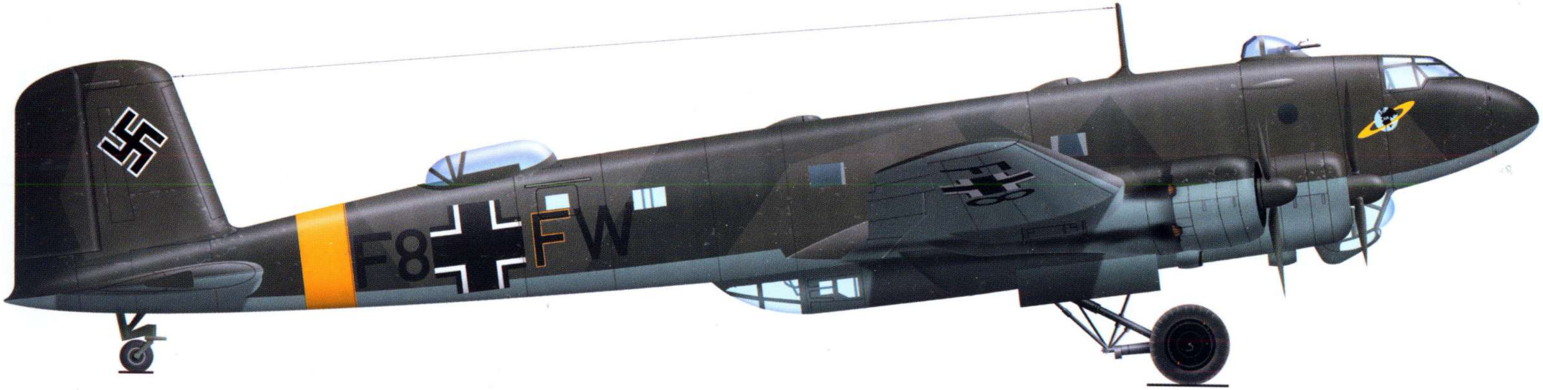
BELOW: The scene inside the fuselage of an Fw 200 during an over-water mission. Note the large 300 ltr (66 imp gal) fuel tank, one of three such tanks that could be installed in the fuselage for extended range missions. These unprotected tanks presented a major fire hazard, and made the aircraft vulnerable to return fire or fighter attack.



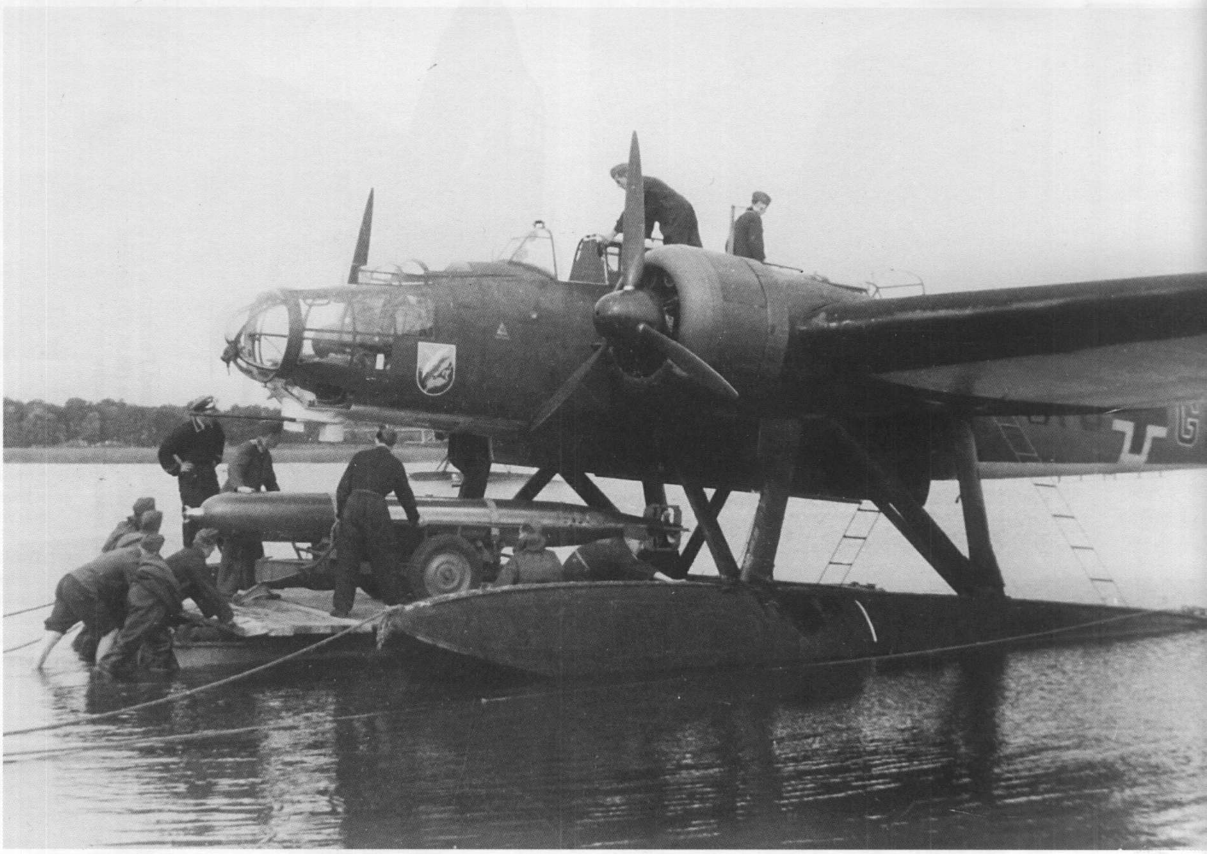
LEFT: This Fw 200 C-3, W.Nr. 0141, coded F8+FW of 12.(Erg)/KG 40 was pressed into use during airlift operations. This fragile aircraft did not take well to operations from primitive airfields, however, as in the case of this example which broke its back on landing.



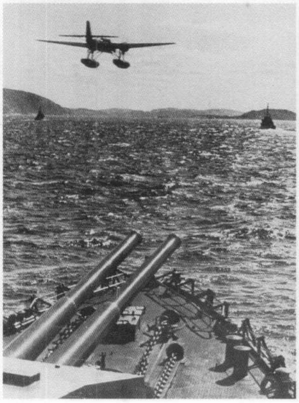
The World-in-Ring emblem of KG 40



Focke-Wulf Fw 200 C-3 of 12.(Erg)/KG 40 based at Chateaudun in France between late 1942 and February 1944
The aircraft has the standard naval uppersurface camouflage of two dark greens (RLM 72 and 73) with pale blue (RLM 65) beneath. The unusual style of Balkenkreuz on the fuselage sides was quite common to Fw 200s for some reason. The Geschwader's famous 'world in a ring' badge was painted on the nose.



ABOVE: Technicians and ground crew loa a torpedo into th weapons bay of a He 115 during th type's operationa evaluation at the Luftwaffe Erprobungsstelle at Travemünde o the Baltic.



ABOVE: A Heinkel He 115 floatplane passes low over German warships during an exercise. Although the aircraft was robust and reliable, its low maximum speed of 290 km/h (180 mph) at sea-level restricted its use in its intended role of torpedo-bomber. In service, the main roles it performed were those of minelaying and maritime reconnaissance.

The Torpedo-Bomber Force

At the beginning of the war a major deficiency in the *Luftwaffe* armoury had been its lack of an effective torpedo-bomber force. Its only aircraft type in service operating in that role was the He 59, an obsolescent twin-engined biplane floatplane. Early in the war the He 115 monoplane floatplane began to replace the He 59 in front line units, but its performance was relatively poor and the type's main offensive role was that of minelaying.

The Italian Air Force had far more knowledge and operational experience with air-launched torpedoes than the *Luftwaffe*, and it agreed to pass on that knowledge to its ally. Thus, at the end of 1941, the *Luftwaffe* sent a small detachment of He 111s and crews drawn from KG 26, to attend the course at the Italian Air Force torpedo school at Grosseto in central Italy. After a period of intensive training, in the following May, I./KG 26 was declared operational in the role. Equipped with He 111 H-6s each modified to carry two F5B torpedoes, the unit moved to Bardufoss in the north of Norway. From there it was to launch attacks on Allied convoys passing around the northern tip of Norway to deliver supplies and military equipment to the Soviet Union.

At the end of May 1942, Convoy PQ 16 came under a coordinated attack from I./KG 26 dropping torpedoes, and Ju 88s of KG 30 delivering dive-bombing attacks. Seven out of 36 ships were sunk.

Shortly afterwards III./KG 26, also trained and equipped for torpedo operations, joined its sister unit in northern Norway. The two *Gruppen* of He 111s, together with a few He 115s, delivered torpedo attacks on the next convoy, PQ 17, soon after it came within range early in July 1942.

Heinkel 111 Torpedo Attack Tactics

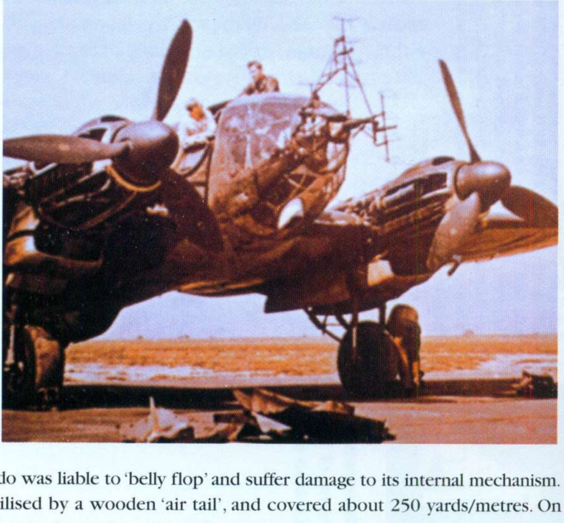
Once an Allied convoy had been detected, either by a patrolling aircraft or a lurking U-boat, a relay of Blohm & Voß Bv 138 flying boats kept it under surveillance and passed a series of reports on its position, course and speed.

When the convoy came within attack range of torpedo-bombers, the latter were ordered into the air. The aircraft took off at 30-second intervals and headed for a briefed landmark or point on the coast, where the leader orbited and the rest of the force assembled into formation behind him. The force then headed for the target convoy, with He 111s flying in loose Vics of between six and ten aircraft, with succeeding Vics following at about 3.2 km (2 mile) intervals.

ABOVE: The Blohm & Voß BV 138 was used in relays in cooperation with U-boats to track Allied convoys once they had been spotted.

ABOVE: A He 111 test aircraft seen dropping a practice torpedo. Until the advent of this converted bomber for that role early in 1942, the Luftwaffe had been without an effective torpedo attack force.

BELOW: A He 111 of KG 26 fitted with Hohentwiel ship-search radar.



About 20 minutes before the attack was to begin, the radio operator in the Bv 138 shadower clamped down his Morse key and transmitted a long homing signal to guide in the attackers. When the leader of the strike force made visual contact with the shadowing aircraft, the latter turned towards the convoy and the attack force followed it.

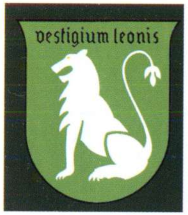
As they prepared to commence their attack run, the torpedo-bombers opened out into line-abreast formation with about 275 m (300 yards) between aircraft. To maintain the element of surprise for as long as possible, the attackers ran it in at an altitude of about 45 m (150 ft).

Once the ships were sighted, each crew selected a target and increased speed to 275 km/h (170 mph). The optimum release range for the F5B torpedo was 1,000 yards/metres from the target ship. The weapon's minimum effective range, allowing it time to complete its air flight, arm itself and settle in its run, was about 700 yards/metres.

Released at 275 km/h (170 mph) at 46 m (150 ft), the torpedo would enter the water at its optimum entry angle of 12 degrees. Those parameters were critical. If the torpedo was released from too great an altitude or too low a speed, it was liable to 'nose-dive' and go too deep to recover. If released from too low an altitude or too great a speed, the torpedo was liable to 'belly flop' and suffer damage to its internal mechanism.

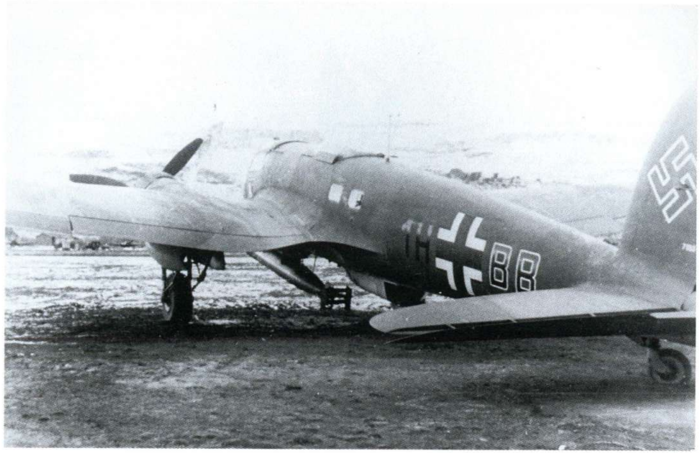
During its three second flight through the air the torpedo was stabilised by a wooden 'air tail', and covered about 250 yards/metres. On impact with the sea, the air tail broke away. Once the torpedo was in the water its engine started. Running at 33 knots, the weapon took about 14 seconds to cover the remainder of the distance to the target. Each He 111 carried two torpedoes, which it usually released in succession with both aimed at the same target.

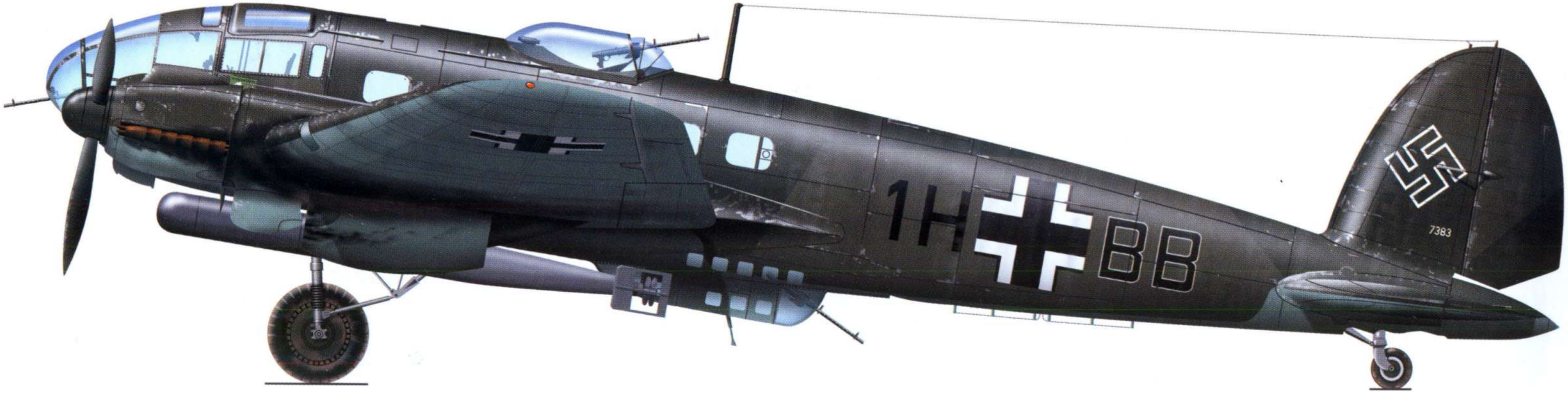
When it released its second torpedo the Heinkel was within about one kilometre (or some half mile) of the target ship. By then it was too late to turn away, so the most common escape manoeuvre was to accelerate at full throttle straight ahead, keeping as low as possible and not commencing evasive jinking until the aircraft was past the last ship in the convoy.



Geschwader emblem of KG 26 in the Stab colours

RIGHT: A rear view of a He 111 H from the Stab of I./KG 26. The machine was camouflaged in the standard splinter pattern using the RLM greens 70/71 with 65 pale blue underneath. An unusual feature is that the last two letters of the code are outlined in white, which was the I. Gruppe colour. Also non-standard is the Hakenkreuz which is painted in a white outline without the black centre.





Heinkel He 111 H-6 (W.Nr.7383) of the I. Gruppe Stab of KG 26 based at Bardufoss in Norway during the autumn of 1942

At this time the Gruppe was commanded by Major Werner Klümper who led many operations against Allied Arctic convoys and was awarded the Ritterkreuz on 29 August 1943.

"Aerial Combat Over Jokanga"

A SHORT ACCOUNT OF THE LAST MISSION BY THE 3. STAFFEL OF KG 30 AGAINST CONVOY PQ 17 WHICH ALSO RELATES THE STORY OF AN AERIAL BATTLE OVER JOKANGA, 9 JULY 1942

During the evening hours of 9 July, there was intense activity in Banak. A small convoy of five to six freighters with escorts (the remnants of PQ 17) had been reported leaving Nowaja Semlja and moving into the White Sea. All serviceable aircraft had been readied for this mission. The air crew of *Ofw*. Domack had taken off from Banak at 00.05 hours. South of Nowaja Semlja the small convoy was sighted. Attack followed attack. Two freighters were sunk *(Hoosier and El Capitan)*. We landed at Kirkenes at 04.45. Orders were already waiting for us to transfer to Petsamo to fly further missions from there. *Ofw*. Dormack landed at Petsamo at 05.45. Refueling and rearming took longer than anticipated and take off did not take place until 09.15. The whole area from Nowaja Semlja to the White Sea was to be searched. To the north the visibility was very poor; fog and a layer of haze hampered the view. We changed course and headed for the southern part of Nowaja Semlja and then to Jokanga at the entrance to the White Sea. No ships were sighted. Cloud cover was 7-8/10 and the ceiling was 1,500 metres. After a short visit to the northern part of the White Sea, the crew decided to head further north to look for stragglers. On our return leg the radio operator noticed two aircraft on the horizon, possibly two Ju 88s. The story looked a little different when another crew member had a look to the rear. The aircraft had come closer. They had twin tail units and were not Ju 88s but two Russian Pe-2s. The bombardier jettisoned the bombs. Our altitude was 800 metres and the cloud cover was at 1500 metres. The pilot immediately went to full power in order to reach the safety of the clouds. It was too late for that. The two Pe-2s worked together, attacking at the same time from behind, one from above the other from below. As soon as the Pe-2s were in an attacking position we heard the mg's of the radio operator and the gunner and the call '*Dive*!' *Ofw*. Domack reacted immediately, with a dive and a left hand turn. The Pe-2s rocketed by us and at the same the call '*Pull up*!' was heard in our earphones. We pulled up at full throttle. These manoeuvres were repeated more than once. After every attack we gained 120-150 metres altitude. After the fifth attack the clouds were reached. The state of mind of the crew does not need to be described here. *Ofw*. Domack stayed in the clouds for quite a while, he flew in circles and checked the instruments. Surprisingly everything was fine and there were also no holes in the fuselage and the wings. After a while we climbed above the clouds and since the enemy was nowhere to be seen we headed for home. On the way home we heard over the wireless that one Ju 88 had been shot down over the sea. We were supposed to land at Banak, but decided to land at Petsamo in order to have the aircraft checked out. One bullet hole was found in the radio. After being entertained by Finnish *Lottas* (female auxiliaries), *Ofw*. Domack took off at 16.25 from Petsamo and landed without problems at 17.30 at Banak.

Simultaneously, Ju 88s of KG 30 delivered dive-bombing attacks on the ships. These attacks inflicted losses, but much worse followed after Ultra decrypts revealed that a powerful German surface force, including the battleship *Tirpitz*, was preparing to set sail to attack the convoy. At that point the convoy received orders to scatter. In the days to follow *Luftwaffe* bombers and torpedo bombers, assisted by U-boats, sank several ships. Of the 36 ships in the original convoy, 23 were lost.

The most successful *Luftwaffe* torpedo attack on a formed convoy took place on 13 September 1942, as Convoy PQ 18 was passing round the north of Norway. Some 40 He 111s of KG 26 delivered a massed attack on the convoy, which sank seven merchant vessels. The aircraft all regained their bases in Norway, though six had suffered major damage. On the following day, KG 26 attempted to repeat that success, sending 22 Heinkels after the escort carrier HMS *Avenger* which formed part of the convoy escort. This time however, the carrier's Sea Hurricane fighters were ready to meet the attackers running in at low altitude. They shot down five Heinkels, and damaged nine more to such an extent that they were beyond repair. The convoy did not lose a single ship.

Following these convoy actions, the *Luftwaffe* torpedo-bomber force was able to achieve little. With the introduction of more of the small escort carriers, the Allied navies could provide fighter cover for convoys needing to pass through waters where they were liable to come under air attack. Moreover, the *Luftwaffe* was on the point of introducing two new air-launched anti-ship weapons that promised to revolutionise this type of operation.

The Anti-Ship Guided Missiles

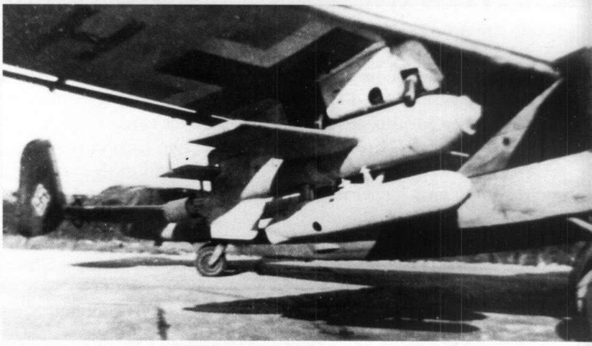
Once Germany found herself at war with Great Britain, the *Luftwaffe* issued a requirement for new types of weaponry that would enhance its capability against the Royal Navy. By the summer of 1943 two separate types of anti-shipping guided missile were ready for action – the Henschel Hs 293 glider bomb and the Rührstahl Fritz-X guided bomb.

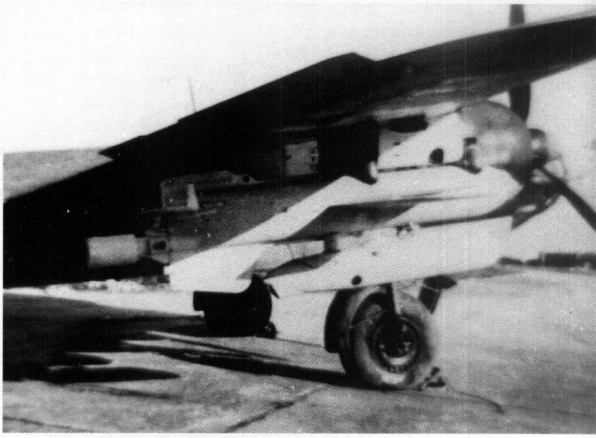
In the spring of 1943 the II./ KG 100 re-equipped with Do 217 E-5s modified to carry one Hs 293 under each outer wing section. In August 1943 the *Gruppe* was declared ready for operations and it moved to Cognac in the south of France.

The Henschel 293 and Fritz-X guided bombs

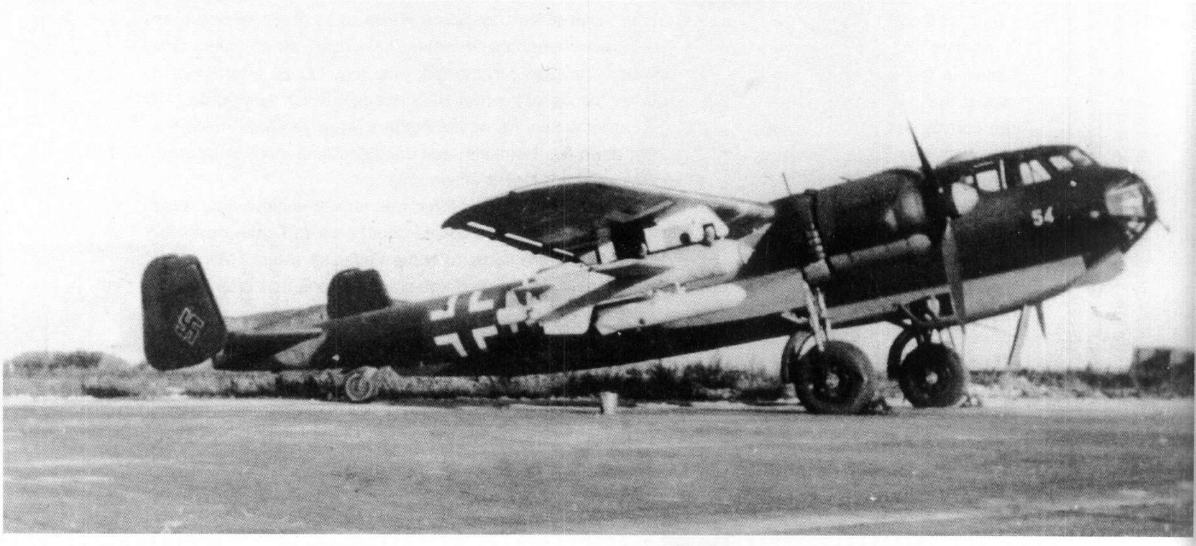
The Hs 293 resembled a small aeroplane with a wingspan of just over 3 m (10 ft) and carried a warhead of 500 kg (1,100 lb). After release from the parent aircraft, a liquid-fuel rocket motor mounted under the fuselage accelerated the weapon to a speed of about 600 km/h (370 mph) in 12 seconds. The rocket motor then cut out and the missile coasted towards the target in a shallow dive, maintaining much of its speed. The weapon's effective range depended on its release altitude. Typically, when released from 1,400 m (4,500 ft), the Hs 293 had an effective range of about 8 km (5 miles).

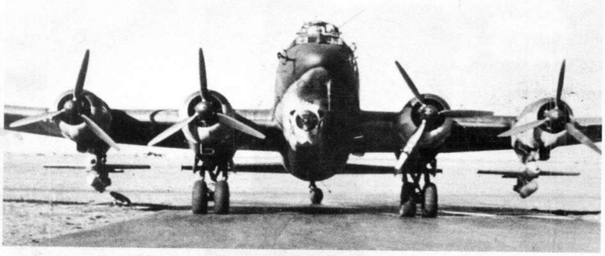
In the tail of the missile was a bright flare, to enable the observer in the parent aircraft to follow its progress in flight. Using a small joystick controller he transmitted the appropriate left-right-up-down signals to the missile. The Hs 293 was what is now termed a command-to-line-of-sight missile, and the observer steered the tracking flare until it appeared to be superimposed on the target ship. He then applied small corrections to hold it there, until the weapon scored a hit. The Hs 293 impacted at a speed of about 480 km/h (300 mph), which gave the warhead relatively little penetrative ability. The weapon was therefore of most value against unarmoured ships, such as merchant vessels or warships of destroyer size or smaller.



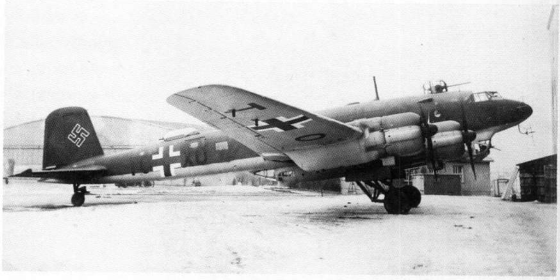


THIS PAGE: A selection of photographs showing a Henschel Hs 293 glide-bomb suspended from an ETC 2000 rack and carried by Do 217 E-5s of 6./KG 100. The duct near the front of the pylon carried hot air from the parent aircraft's de-icing system to the weapon's guidance and control systems, to prevent these freezing up during the flight to the target. After launch, the rocket motor under the fuselage boosted the missile to speeds of around 600 km/h (370 mph). Then, its fuel exhausted, the missile coasted the rest of the way to the target guided by radio control. The spinner tips of the aircraft shown here are painted in the 6. Staffel colour of yellow.

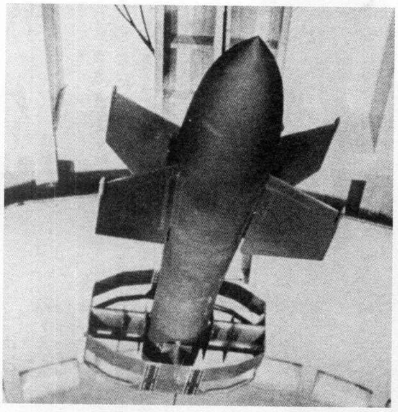




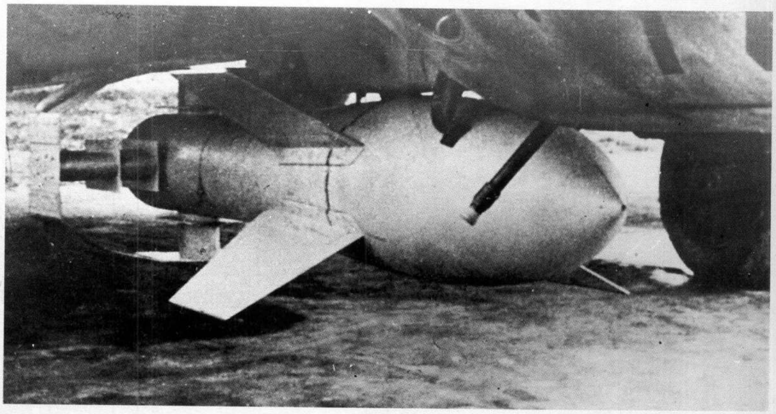
ABOVE: An Fw 200, possibly at the Erprobungsstelle Karlshagen, fitted with an experimental installation of one Hs 293 mounted under each outer engine. It is not thought that the aircraft was ever sent into action in this configuration.



ABOVE: A late production Fw 200 C-8, with deepened nacelles on the outer engines to allow it to carry an Hs 293 missile.



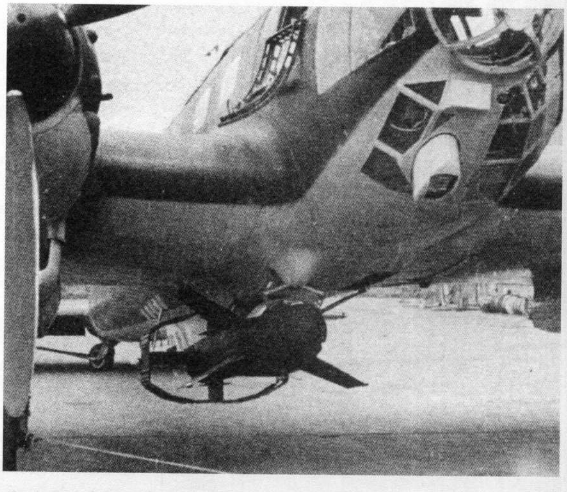
ABOVE: A Fritz-X (PC 1400 FX) undergoing aerodynamic tests in a wind tunnel at the Deutsche Aerodynamische Versuchsanstalt (AVA).



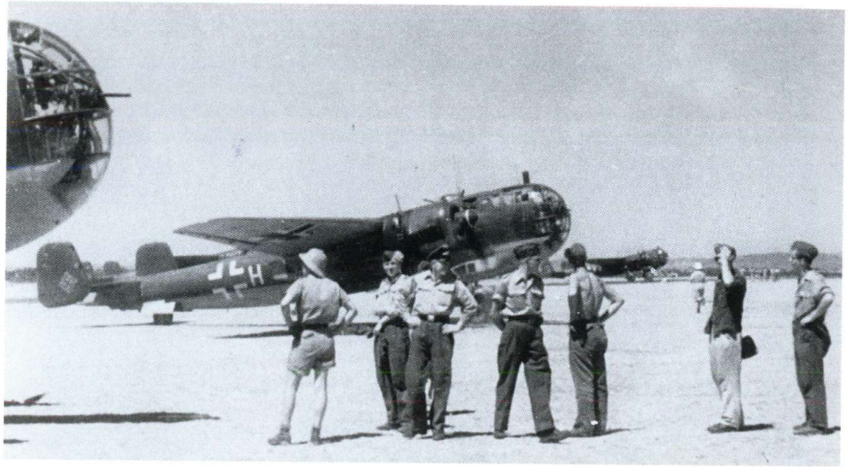
ABOVE: The Fritz-X radio-guided armour-piercing bomb, weighing 1,400 kg (3,090 lbs), pictured mounted on the fuselage bomb rack of a He 177. Released from altitudes around 6,100 metres (20,000 ft), the unpowered weapon achieved an impact velocity close to the speed of sound, enabling it to penetrate the deck armour of a heavy cruiser or a battleship.

The second of the new German guided weapons, the Fritz-X guided bomb, employed a radio control system almost identical to that fitted to the Hs 293. In every other respect, however, it was a quite different weapon. Intended for use against armoured warships, battleships and heavy cruisers, the 1,400 kg (3,100 lb) Fritz-X resembled an ordinary free-fall bomb but had four stub-wings set in cruciform mid-way along its body. The weapon was unpowered. Released from altitudes between 5,000 and 7,000 m (16,000 ft and 23,000 ft), it accelerated under gravity to a speed of around 950 km/h (600 mph). That gave the weapon sufficient momentum to punch its way through the heaviest deck armour.

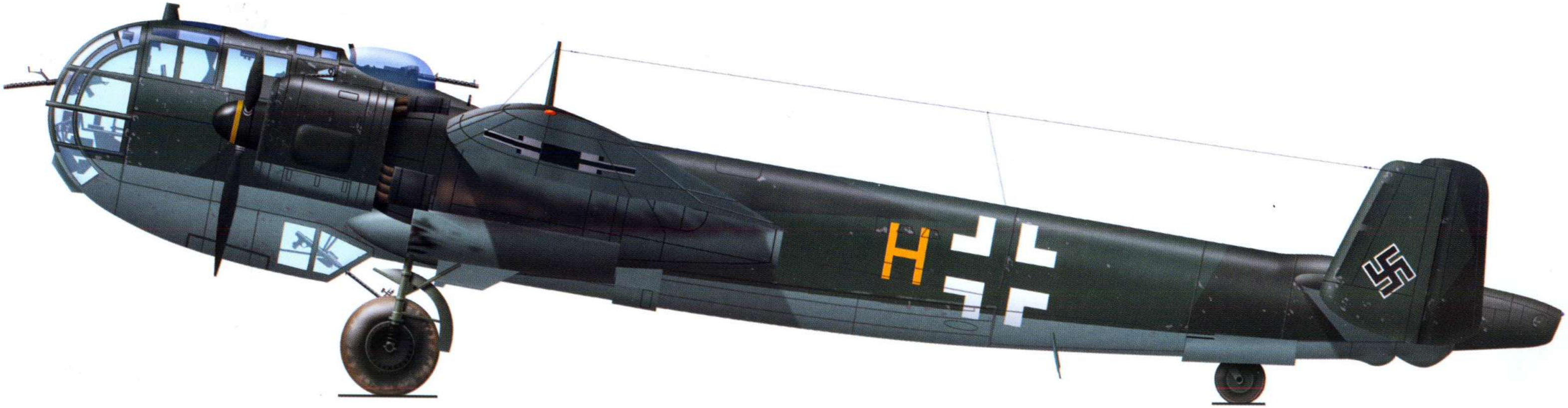
The aircraft's observer aimed the Fritz-X in the same way as a normal bomb, using the standard *Lotfe* bombsight. Immediately after bomb release the pilot throttled back the engines and climbed the aircraft through 300 m (1,000 ft), then levelled off. That manoeuvre reduced the aircraft's speed rapidly from 450 km/h (280 mph) to 265 km/h (165 mph), and placed the observer guiding the missile in a position that looked vertically down the final part of the bomb's trajectory. As in the case of the Hs 293, the observer steered the missile's tracking flare until it appeared superimposed over the target, and held it there until the weapon impacted.



ABOVE: This He 111 H was used by the AVA as a test aircraft for dropping trials of the Fritz-X guided bomb.



RIGHT: Dornier Do 217 K-2s of III./KG 100 pictured at Istres near Marseilles in the summer of 1943. This variant of the bomber was specially modified to carry the Fritz-X weapon, and had its wing extended by just over 5.4 m (18 ft). The additional wing area enabled it to carry the weapon to the required release altitude above 6,100 m (20,000 ft). The aircraft could carry two Fritz-X guided bombs, one between each of the engine nacelles and the fuselage. The radio control system allowed each observer to control only one missile at a time, however, which would have meant making two separate bombing runs in an area where the aircraft were liable to be intercepted by Allied fighters. That was considered too dangerous, and on combat missions each aircraft carried just one Fritz-X.

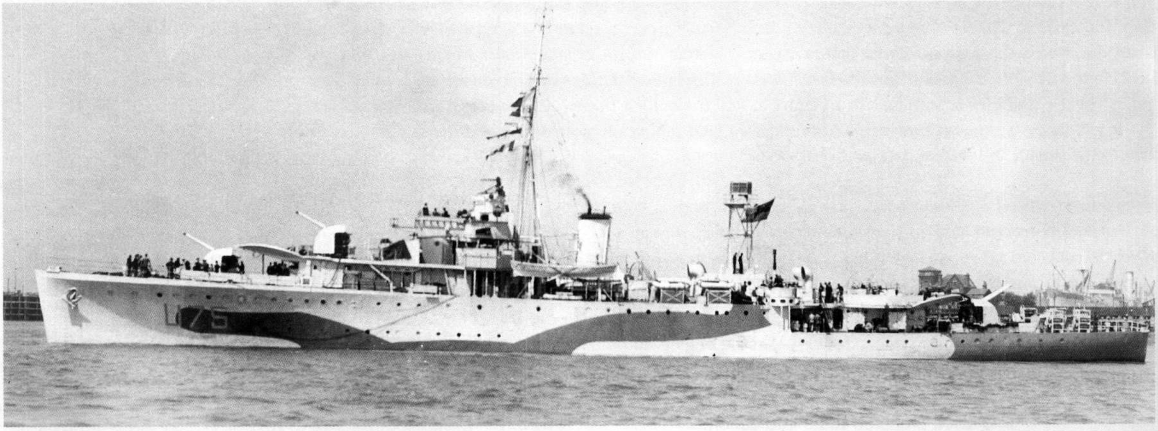


Dornier Do 217 K-2 of III./KG 100 based at Marseilles-Istres between July and November 1943
Up until September the Gruppe was commanded by Major Bernhard Jope, with Hptm. Gerhard Döhler succeeding him. The uppersurfaces of the unit's aircraft were painted in dark greens (RLM 72 and 73) with pale blue beneath. The Fritx X missiles were also painted pale blue.

The first ever attack using air-launched guided missiles took place on 25 August 1943, when *Hptm.* Heinz Molinnus led fourteen Dorniers of II./KG 100 in an attack on a Royal Navy submarine-hunting group operating off the north-western tip of Spain. Although the Do 217 had the ability to carry two Hs 293s on operations, the aircraft invariably carried an Hs 293 under the starboard wing, and a 66 gallon drop tank under the port wing to provide additional fuel and also to serve as a counter-weight. During that first attack, the destroyer HMS *Landguard* suffered damage from a near miss, but otherwise the warships escaped unscathed.

Two days later a follow-up attack by 18 Dorniers was more successful. One glider bomb scored a direct hit on the sloop HMS *Egret.*

The Sinking of HMS Egret

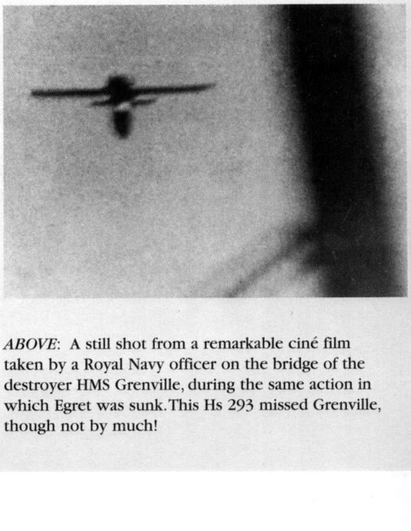


ABOVE: On 27 August 1943 the Royal Navy frigate Egret was the first warship to be sunk by an air-launched guided missile when Do 217s of II./KG 100 attacked its task group with Henschel Hs 293 glider bombs. One of the missiles hit the vessel amidships and detonated depth charges in her magazine; the warship then broke into two and sank rapidly.

On 27 August 1943 the 1,200-ton sloop HMS *Egret* gained the unenviable distinction of being the first ship ever sunk by an air-launched guided missile. The author is indebted to Captain Godfrey Brewer, the ship's commander, for his description of the action:

"At about 2 pm we sighted 21 aircraft coming over the horizon. They quickly sized up the situation and split up into three groups of seven, each one concentrating on an AA ship but keeping out of gun range. No normal bombing attack developed but suddenly from Egret's opponents a puff of smoke appeared underneath each aircraft, an object shot ahead and above it for all the world as if a tennis player was throwing up a ball to serve, and then turned and sped towards us at very high velocity. As they drew closer five exploded in the water either short or over, and one coming straight for the bridge was hit and exploded by a 20 mm Oerlikon shell - a very fine piece of shooting. But the seventh, which had looked as if it was going to pass down our starboard side, turned in and hit us abreast the after magazine.

"There was an enormous explosion as the magazine blew up, the sky was filled with burning pieces of cordite which fell all around us and, with a strange sense of detachment, I looked at my clothing on fire and thought 'How odd?' Then something hit me on the head and I lost consciousness. The next thing I knew was that I was floating in the water alongside the upturned bow of Egret. She had capsized and as she did so I was washed out of the bridge structure by the inrush of water as she turned over. Out of a complement of 250 only 28 survived; and those were from the bridge personnel and the people from the two foremost guns, who had been sheltered from the appalling blast."



ABOVE: A still shot from a remarkable ciné film taken by a Royal Navy officer on the bridge of the destroyer HMS Grenville, during the same action in which Egret was sunk. This Hs 293 missed Grenville, though not by much!

Sabotage of the Glider-Bomb Carriers

During the late summer and autumn of 1943 the Do 217s of II./KG 100 carried out several attacks on Allied ships. Yet successes were few because, as during the attack on *Egret*, a high proportion of the missiles failed to obey the guidance signals from the parent aircraft during part of their flight. Later, in response to complaints from aircrew, technical staff at Bordeaux/Merignac airfield carried out an investigation into the cause of the failures. *Fw.* Fritz Trenkle took part in the investigation and he discovered that the missile-carrying aircraft had been sabotaged in a very clever way.

He told the author: "The command guidance signals from the aircraft transmitter were carried to the aerial via a co-axial cable, and somebody had cut the central conducting wire half-way along its length and then reassembled the cable. It was very clever, and obviously done by an expert. When we tested the transmitters on the ground with the aircraft engines stopped, the central conducting wire made good contact and the signals were radiated properly. But when the engines were running the vibration caused the gap in the wire to open and close so that for long periods the guidance signals never reached the aerial. Once I had discovered the reason for the failure we checked all the Hs 293 carrying aircraft, Do 217s and He 177s, and found that about half had been 'doctored' in this way. The SS carried out exhaustive inquiries at Merignac in an effort to find the culprit, but without success."

It will never be known how many hundreds of Allied sailors unknowingly owed their lives to the stealth and skill of that nameless saboteur.

ABOVE: Major Bernhard Jope, Kommandeur of III./KG 100, led the attack on the Italian battle fleet on 9 September 1943. Earlier in the war he had achieved distinction flying with KG 40 in the anti-shipping role, and he received the Ritterkreuz for inflicting severe damage to the troopship Empress of Britain so that she could be finished off by a U-boat a few days later.

During the same action the destroyer HMCS *Athabascan* suffered serious blast and splinter damage when a missile passed clean through her superstructure and exploded close to her starboard side.

Meanwhile, the III./KG 100 had re-equipped with the Do 217 K-2, able to carry one Fritz-X under the wing on each side, between the engine and the fuselage. To provide improved altitude performance for Fritz-X attacks, the wing span of the K-2 was lengthened to 24.68 m (81 ft 4 in) – 5.8 m (19 ft) greater than the regular bomber version. During August 1943 III./KG 100 moved to Marseilles/Istres and it too prepared to go into action.

The Fritz-X scored its first success on 9 September, as the main body of the Italian battle fleet was on its way to Malta to surrender to the Allies under the terms of the armistice agreement. As the Italian force neared the Strait of Bonifacio between Corsica and Sardinia, *Major* Bernhard Jope caught up with them at the head of 11 Do 217K-2s each carrying one Fritz-X missile.

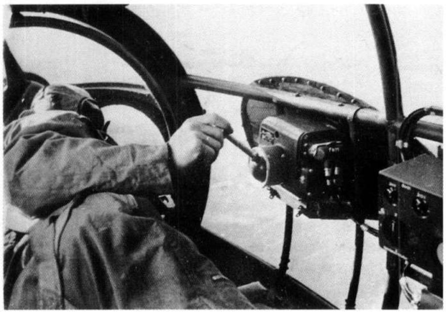
The bombers delivered a devastatingly accurate attack from altitudes around 7,000 m (23,000 ft), which sank the battleship *Roma* and caused serious damage to her sister ship the *Italia.*

Also on that day, American and British troops landed at Salerno in southern Italy. In the week that followed, Jope's Dorniers were heavily engaged against shipping off the beachhead. Fritz-X missiles scored direct hits on the battleship HMS *Warspite* and the cruisers USS *Savannah* and HMS *Uganda,* causing severe damage to all three.

When they carried the new guided missiles, the launching aircraft could deliver attacks on shipping with greater accuracy and with less risk to themselves than when using torpedoes. However, the mounting scale of fighter cover meant that even now the German bombers were unable to attack Allied shipping with impunity. A weakness common to both weapons was that after missile launch the aircraft had to fly a predictable path, and that made it vulnerable to fighter attack. If the launching aircraft made any sort of tight turn to avoid attack while its missile was in flight, the latter could no longer be controlled and had to be abandoned.

The Hs 293 and the Fritz-X missiles achieved their most spectacular successes in the weeks following their introduction. *Luftwaffe* leaders were expecting much from them in the future, when the Allies next chose to mount a large-scale amphibious landing operation against a point on the German-held coastline. These operations will be described in the next Volume in this series.

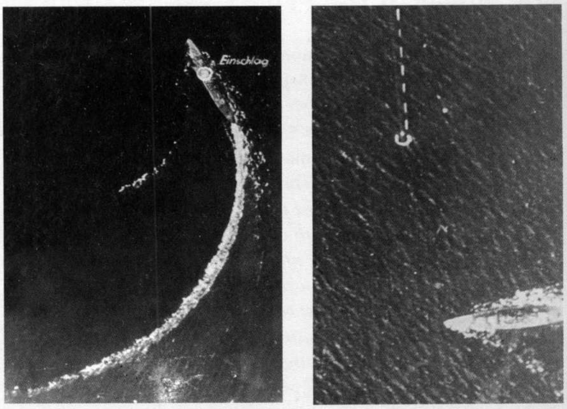
BELOW: A view inside the cockpit if the He 111 carrier aircraft showing the bomb aimer operating the radio control unit which transmitted guidance signals to the Hs 293 glider bomb on its way to the target.



The Sinking of the Battleship Roma

On 9 September 1943 the main body of the Italian battle fleet - comprising three battleships, six cruisers and eight destroyers - left its bases and sailed to Malta to surrender to the Allies. German aircraft shadowed the warships and reported on their progress, and early that afternoon *Major* Bernhard Jope led a striking force of 11 Do 217 Ks from III./KG 100, each carrying a single Fritz-X guided bomb, to attack them. It was a beautiful Mediterranean summer's day with visibility almost unlimited, and Jope's crews had little difficulty in finding their quarry.

The Dorniers ran in to bomb at levels around 6,000 m (20,000 ft), and at that altitude the vigorous defensive fire from the ships was inaccurate and ineffective. On the surface far below, the Italian ships increased speed and went into a series of tight turns, twisting this way and that in their efforts to throw the German aircraft off their aim. Had they been confronted by normal high-altitude bombers, the Italian moves would have been successful; a bomb released from 6,000 m takes nearly 45 seconds to reach the surface, and in that time a warship at full steam will cover 640 m (700 yards) forwards or to either side.



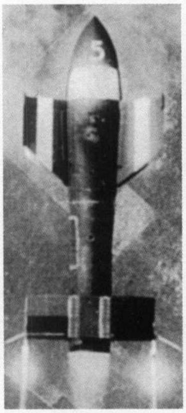
ABOVE: Combat camera photographs taken from a Do 217 of III./KG 100 on 9 September 1943, during the attack on the Italian battleship Roma with Fritz-X weapons. The warship was in a sharp turn to port, and the missile's tracking flare (marked with a semi-circle and dashed line) was being steered towards the Roma. Two of these weapons hit the warship, starting an uncontrollable fire below decks.

Jope's aircraft were loaded with radio-controlled bombs, however, and the evasive manoeuvres afforded the ships little protection. Jope told the author: "From so high up we could not recognise the individual ships; we just picked upon the biggest we could see, and ran in to bomb that."

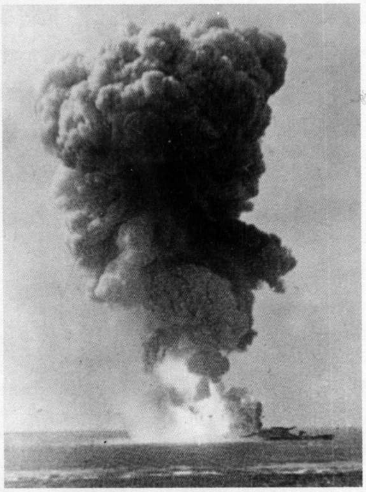
The first to be hit was the flagship, the modern 35,000-ton battleship *Roma*. The missile struck her just to starboard of the after mast, punched its way clean through the ship and exploded immediately underneath her. *Roma* was seriously damaged, her starboard steam turbines ground to a halt and she began to lose speed. A few minutes later *Roma* took a second hit, this time between the bridge and her 'B' turret. That knocked out the steam turbines on the port side and, her propulsion systems wrecked, the battleship slid to a stop. Below decks a fierce fire raged, which burned its way through to the forward magazine. When it reached the explosives there was a huge detonation, the ship folded up like a jack-knife and broke into two. She then sank, with heavy loss of life.

Shortly after the first hit on *Roma*, her sister ship the *Italia* suffered a Fritz-X hit on her bow. That battleship took on some 800 tons of seawater and her speed was reduced to 24 knots, but she reached Malta under her own steam.

None of the German crews saw the effects of their attack. As Jope commented: "We did not see the *Roma* explode. That happened after we left. We saw the explosions as the bombs hit, sure, but how often had we seen this before and then the ship managed to limp back to port." Only later, when the news was given out in Allied news broadcasts, did the men of III./KG 100 learn how successful their attack had been.

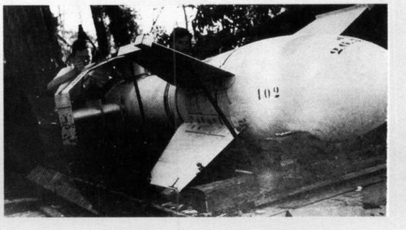


LEFT: An aerial view taken from a test aircraft. This Fritz-X has been specially painted and fitted with mini rockets to show the aerodynamic effect of the weapon as it drops to earth. Most of these trials were filmed so that the effects could be studied and the necessary technical and mechanical alterations could be made.



RIGHT: When the fire below decks in Roma reached the ammunition in the forward magazine, the battleship exploded violently.

BELOW: Roma broke into two and sank rapidly, taking down many of her crew.



LEFT: A Fritz-X as discovered by the Allies. The photograph gives a good indication of the size of the 1,400 kg (3,100 lb) weapon.

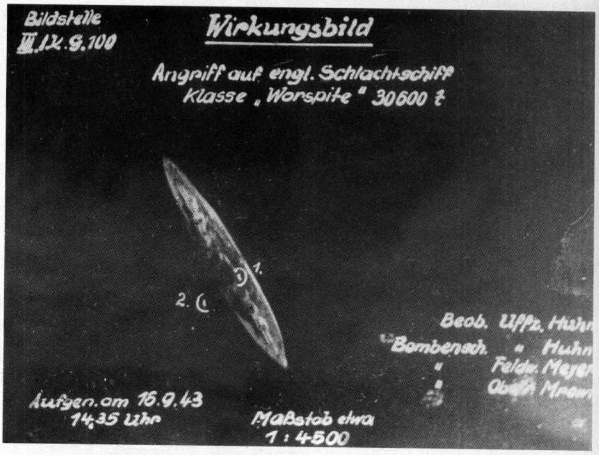
The Power of the Fritz-X (PC 1400 FX)

The reader may gain an impression of the power of the Fritz-X from the official Royal Navy account of the damage inflicted on the battleship HMS *Warspite* on 16 September 1943. The vessel was lucky to survive attacks from three of the guided bombs, one of which scored a direct hit while the other two were near misses. It is interesting to note that one weapon which scored a near miss caused more damage than the direct hit. *Warspite* took on 5,000 tons of seawater and her freeboard was lowered by five ft. In view of the scale of the damage, it was remarkable that the casualties amounted to only nine killed and fourteen wounded. After the attack the battleship had to be towed to Malta:

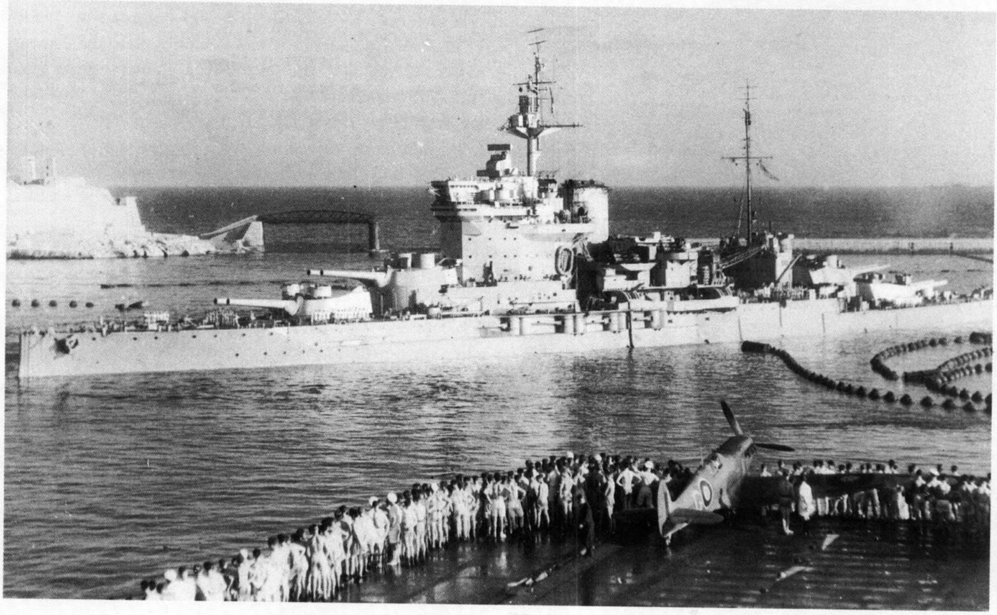
"Warspite was damaged while in action off the Salerno beaches at 10 knots. A direct hit on the boat deck just abaft the funnel, perforated various decks, passed through No 4 boiler room and finally detonated in the double bottoms. The outer bottom was holed for a length of 20 ft and for a width of 7-14 ft and the inner bottom was blown upwards over this area. No 4 boiler room was wrecked. Main transverse bulkheads, forward, after and between the boiler rooms were buckled and damaged by splinters.

"A near miss on the starboard side burst underwater near the bottom of the bulge abreast No 5 boiler room, corrugating the inner and outer bottom plating under this boiler room. The bulge plating was also ruptured and distorted. Immediate flooding occurred in Nos 2, 3, 4, 5, and 6 boiler rooms, the double bottom air spaces and in the OF [oil fuel] tanks, lower bulge and the cable passages near machinery spaces. Slow flooding was controlled in both engine rooms, No 1 boiler room, two dynamo rooms, shaft passages and various other compartments abreast the machinery spaces. A list to starboard reached a maximum of 4 degrees. All boilers were damaged by shock and flooding and the feed water was contaminated. The main turbines, although unusable through loss of steam, were not materially damaged. Electrical power failed through the lack of steam but essential services were supplied by diesels. W/T (wireless) and radar equipment suffered through the loss of aerials, flooding and shock.

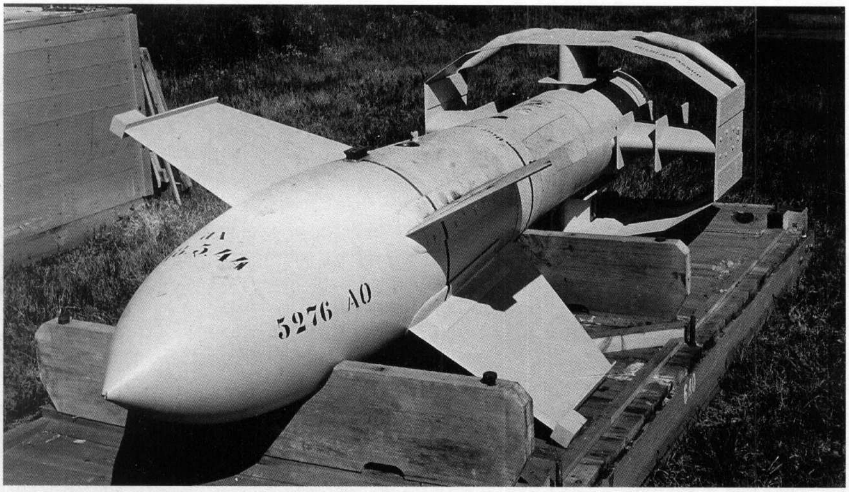
"Fighting efficiency - seriously impaired. The ship was immobilised through the loss of steam and W/T and radar equipment were out of action. Main armament was out of action due to the loss of hydraulic power. Time out of action: 7 months."



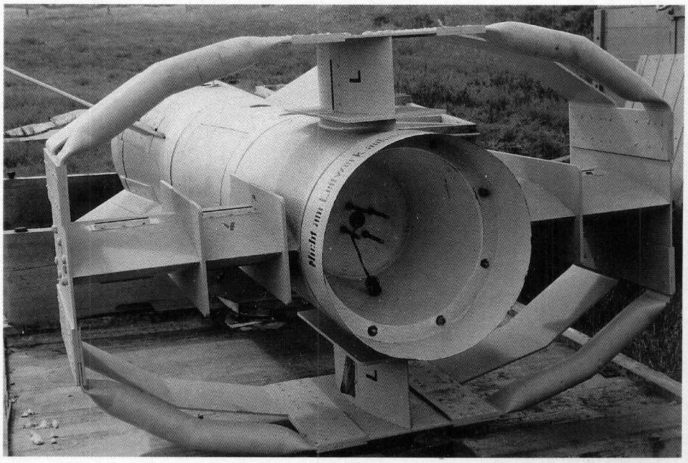
ABOVE: A combat camera photograph showing HMS Warspite under attack from two Fritz-X bombs on 16 September 1943. At the time, the battleship was moving inshore to provide gunfire support for Allied troops landing at Salerno in Italy.



LEFT: Hit by one Fritz-X missile and suffering two near misses, the battleship HMS Warspite suffered severe damage. One weapon penetrated six decks to explode on, and blow a hole through, her double bottom. The vessel took on 5,000 tons of water and her freeboard was lowered as the photograph shows. The warship had to be towed to Malta for makeshift repairs.

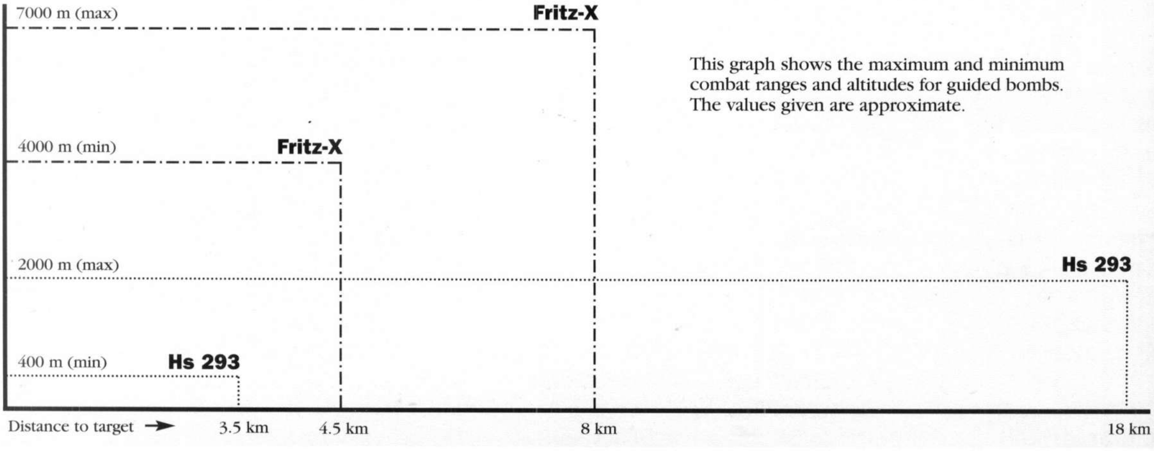


LEFT AND BELOW:
Two photographs of a Fritz-X (PC 1400 FX) radio-controlled bomb on its delivery stand.



Main specification for Fritz-X (PC 1400 FX)
Manufactured by Rheinmetall-Borsig
Berlin/Marienfelde.

Length	3.262 m	10 ft 9 inches
Span	1.350 m	4 ft 5 inches
Diameter	562 mm	1 ft 10 inches
Total weight	1,570 kg	3,454 lbs
Warhead weight	1,150 kg	2,530 lbs
Explosive weight	300 kg	660 lbs



This graph shows the maximum and minimum combat ranges and altitudes for guided bombs. The values given are approximate.

Luftwaffe Bomber Order of Battle 17 May 1943

This table gives the strength of the Luftwaffe long-range bomber units on 17 May 1943. On that day the force had a strength of 49 *Gruppen* and four independent *Staffeln*, with 899 serviceable aircraft. The force was, therefore, little stronger than it had been a year earlier, though on each battle front it faced enemy air forces that were numerically considerably stronger and operating aircraft that were more modern. Moreover, in terms of operational capability, the force was substantially weaker than those meagre numbers would suggest. Of the 49 bomber *Gruppen* only 26 (with 568 serviceable aircraft), were currently available for operations. The remaining 23 *Gruppen* (47 per cent of the total) were for the most part in Metropolitan Germany in the process of forming, reforming after suffering heavy losses, re-equipping with different aircraft types, or otherwise were unready for immediate action.

The 26 *Gruppen* available for operations had to meet the needs of the Western Front operating against Great Britain, the Eastern Front and The Mediterranean Front. There was nothing in reserve; any one area could be reinforced only by transferring units from one or more of the other theatres. Even had all 26 combat ready *Gruppen* been concentrated on one battle front, their fighting power would scarcely be overwhelming.

Fifteen *Gruppen*, or just over half those that were combat ready, were deployed on the Eastern Front. Nine *Gruppen* were assigned to *Luftflotte* 2 in the Mediterranean and only two *Gruppen* were deployed to *Luftflotte* 3 engaged in the attacks on Great Britain.

The bulk of the combat ready long-range bomber units still operated He 111s or Ju 88s. Both types had entered service before the outbreak of war, and despite some development both types were now obsolescent. The only new long-range bomber type to enter service since the beginning of the war, the Dornier 217, was a fast modern aircraft but it equipped only two of the combat ready *Gruppen*.

Despite its many problems, however, the *Luftwaffe* was girding itself to renew the fight in the coming summer. Four new bomber *Gruppen* were in the process of forming, three with the Ju 88 and one with the He 177 heavy bombers. Six *Gruppen* were re-equipping with new aircraft types or weapons – four with the He 177, and two with Do 217s modified to carry the new radio-controlled anti-shipping missiles. Eight bomber *Gruppen* were in the process of re-forming, and these would return to the fray in a few weeks.

LUFTFLOTTE 1 (Northern Front in Russia)

Stab/KG 53	He 111	Korowje-Selo	4	(4)
I. *Gruppe*/KG 53	He 111	Korowje-Selo	37	(37)
III. *Gruppe*/KG 53	He 111	Pleskau	37	(33)
15. *(Kroat)Staffel*/KG 53	Do 17 *(Croatian unit)*	Agram	12	(12)

LUFTFLOTTE 2 (Mediterranean)

Stab/LG 1	Ju 88	Eleusis	1	(1)
I. *Gruppe*/LG 1	Ju 88	Foggia	37	(29)
II. *Gruppe*/LG 1	Ju 88 *(retraining)*	Eleusis	31	(10)
II. *Gruppe*/KG 1	Ju 88	Grottaglie	26	(14)
II. *Gruppe*/KG 26	Ju 88 *(torpedo bombers)*	Villacidro	38	(20)
III. *Gruppe*/KG 26	Ju 88 *(torpedo bombers)*	Grosseto	13	(7)
Beleuchterstaffel/KG 26	Ju 88 *(illuminating enemy shipping to facilitate night torpedo attacks)*		5	(0)
III. *Gruppe*/KG 30	Ju 88	Comiso	32	(30)
Stab/KG 54	Ju 88	Catania	1	(1)
I. *Gruppe*/KG 54	Ju 88	Catania	20	(11)
II. *Gruppe*/KG 54	Ju 88	Catania	22	(10)
III. *Gruppe*/KG 54	Ju 88 *(retraining)*	Piacenza	34	(16)
Stab/KG 76	Ju 88	Foggia	2	(2)
I. *Gruppe*/KG 76	Ju 88 *(retraining)*	Foggia	36	(2)
III. *Gruppe*/KG 76	Ju 88	Foggia	32	(23)
II. *Gruppe*/KG 77	Ju 88 *(retraining)*	Piacenza	26	(20)
III. *Gruppe*/KG 77	Ju 88	Piacenza	20	(14)

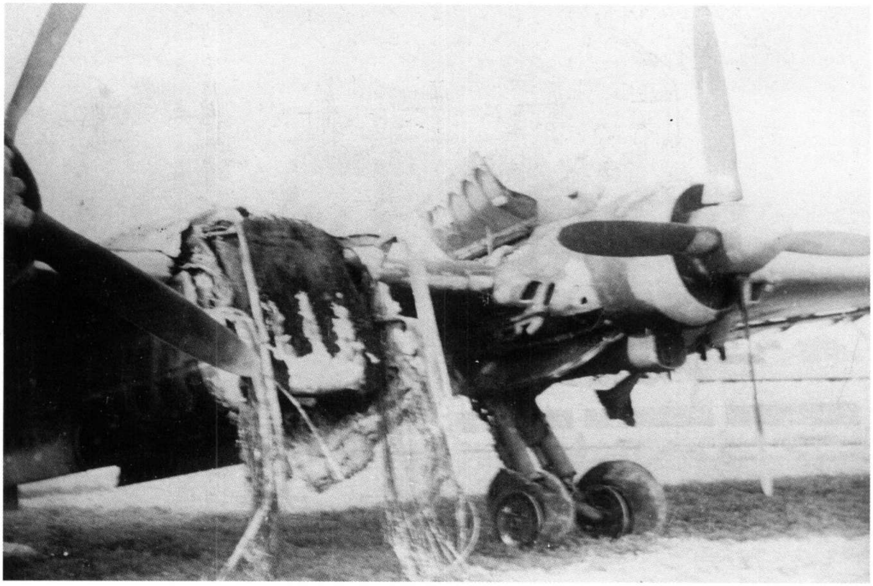
LUFTFLOTTE 3 (France, Belgium and Holland)

I. *Gruppe*/KG 1	Ju 88 *(retraining)*	Neuhausen	20	(0)
Stab/KG 2	Do 217	Soesterburg	2	(2)
I. *Gruppe*/KG 2	Do 217	Eindhoven	21	(8)
III. *Gruppe*/KG 2	Do 217 (*Providing additional training for crews assigned to attacks on Great Britain)*	Soesterburg	18	(17)
I. *Gruppe*/KG 6	Ju 88 *(retraining)*Beauvais		31	(21)

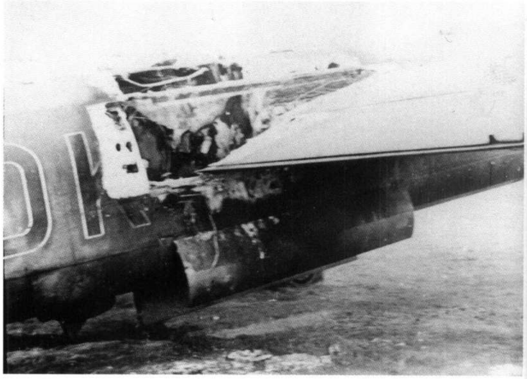
II. *Gruppe*/KG 6	Ju 88 *(retraining)*	Cormeilles	20	(15)
III. *Gruppe*/KG 6	Ju 88 *(retraining)*	Creil	34	(28)
Stab/KG 40	He 177	Bordeaux-Merignac	1	(0)
II. *Gruppe*/KG 40	Do 217	Gilze-Rijen	21	(19)
I. *Gruppe*/KG 66	Do 217 *(newly forming)*	Chartres	23	(7)
***LUFTFLOTTE* 4 (Southern Front in Russia)**				
Stab/KG 3	Ju 88	Poltawa	1	(0)
II. *Gruppe*/KG 3	Ju 88	Poltawa	37	(27)
III. *Gruppe*/KG 3	Ju 88	Poltawa	31	(13)
Stab/KG 27	He 111	Charkow	2	(0)
I. *Gruppe*/KG 27	He 111	Charkow	34	(13)
III. *Gruppe*/KG 27	He 111	Charkow-Woitschenko	23	(15)
14. *Staffel*KG 27	He 111 *railway attack unit)*	Charkow	9	(6)
III. *Gruppe*/KG 51	Ju 88	Saporoshje	21	(11)
Stab/KG 55	He 111	Morosowskaja	4	(4)
I. *Gruppe*/KG 55	He 111	Stalino	19	(13)
II. *Gruppe*/KG 55	He 111	Stalino	30	(19)
III. *Gruppe*/KG 55	He 111	Stalino and Charkow	33	(20)
I. *Gruppe*/KG 100	He 111	Stalino	37	(35)
***LUFTFLOTTE* 5 (Norway, Finland)**				
I. *Gruppe*/KG 30	Ju 88	Kemi	37	(32)
***LUFTFLOTTE* 6 (Central Front in Russia)**				
Stab/KG 1	Ju 88	Dno	4	(4)
III. *Gruppe*/KG 1	Ju 88	Dno	37	(18)
Stab/KG 4	He 111	Seschtschinskaja	1	(0)
II. *Gruppe*/KG 4	He 111	Karatschew	37	(23)
III. *Gruppe*/KG 4	He 111 *(retraining)*	Schatalowka-West	37	(23)
II. *Gruppe*/KG 51	Ju 88	Bryansk	37	(28)
***LUFTWAFFENKOMMANDO SÜD OST* (Balkans)**				
Einsatzstaffel Luftwaffe Stab Kroatian	Ju 88	(Unknown)	37	(32)
***LUFTWAFFENBEFELSHABER MITTE* (Metropolitan Germany)**				
II. *Gruppe*/KG 2	Do 217	Münster-Handorf	26	(26)
	Me 410 *(re-equipping)*	Münster-Handorf	9	(3)
I. *Gruppe*/KG 3	Ju 88 *(retraining)*	(Unknown)	37	(29)
I. *Gruppe*/KG 4	He 177	Lechfeld	0	(0)
I. *Gruppe*/KG 26	He 111 *(retraining)*	Salon de Province	19	(10)
II. *Gruppe*/KG 27	He 111 *(retraining)*	Neuhausen	37	(28)
I. *Gruppe*/KG 40	He 177 *(re-equipping)*	Fassberg	12	(10)
	Fw 200	Fassberg	6	(1)
III. *Gruppe*/KG 40	He 177 *(re-equipping)*	Fassberg	12	(12)
	Fw 200	Cognac	11	(2)
I. *Gruppe*/KG 50	He 177 *(newly forming)*	Burg-Magdeburg	9	(4)
II. *Gruppe*/KG 53	He 111 *(retraining)*	Gablingen	3	(0)
II. *Gruppe*/KG 76	Ju 88 *(retraining)*	Kitzingen	5	(3)
II. *Gruppe*/KG 100	Do 217*(re-equipping with aircraft modified to carry the Hs 293 guided missile)*	Garz-Usedom	37	(0)
III. *Gruppe*/KG 100	Do 217 *(re-equipping with aircraft modified to carry the Fritx-X guided missile)*	Schwäbisch-Hall	35	(11)

Summary

Could the Luftwaffe Have Sustained a Large-Scale Strategic Bombing Campaign?



LEFT AND BELOW: The He 177 was rushed into production, and many were lost following engine fires. All attempts to introduce the aircraft into combat between the beginning of 1942 and September 1943 ended in failure. The type was withdrawn for a major programme of modifications. This He 177 A-1 was being used as a trainer with Flugzeugführerschule (B) 16 at Burg/Magdeburg with many of the unit's aircraft ending up this way due to technical malfunction.



The inability of the *Luftwaffe* to field a strategic heavy bomber force, to compare with those of the Western Allies attacking the German homeland, was a source of considerable embarrassment to Adolf Hitler. He dreamed of being able to retaliate in kind for the crushing Allied air attacks. Yet, even had the He 177 suffered no problems and its production had moved at the rate originally planned, could the *Luftwaffe* have mounted a large-scale strategic bomber offensive to compare with those of the western Allies? There is reason to believe it could not.

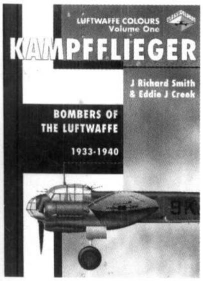
Had the He 177 not suffered so many problems, by September 1943 the *Luftwaffe* might have had about 400 of these heavy bombers ready for operations. Yet by that time the *Luftwaffe* was already facing serious shortages of aviation fuel since during the periods of considerable air activity that summer, the supply of fuel had failed to meet the heavy demand. As a result, it had been necessary to dig deeply into the reserves.

Allowing an average of six tons of fuel per aircraft, for an attack on a medium-range target, a force of 400 bombers required about 2,400 tons of fuel per raid. If the force mounted six attacks per month, it required 14,400 tons. Adding 50 per cent extra for training and essential non-operational flying, the force's monthly fuel requirement would be about 21,600 tons. That figure represented more than one-eighth of average German monthly production of aviation fuel during 1943 (after which the fuel situation for the *Luftwaffe* would get considerably worse).

In short, even if the German aircraft factories had turned out sufficient heavy bombers, from the summer of 1943, the German fuel industry produced insufficient aviation fuel to support a large-scale strategic bomber offensive. Probably the most it could have achieved was to mount attacks with 200 or so heavy bombers, repeated four times each month. In the long run that was not enough to secure any decisive military advantage.

LUFTWAFFE COLOURS

KAMPFFLIEGER



LUFTWAFFE COLOURS
Volume One
KAMPFFLIEGER
J Richard Smith
& Eddie J Creek
BOMBERS OF
THE LUFTWAFFE
1933-1940

Volume 1

BOMBERS OF THE LUFTWAFFE

1939-1940

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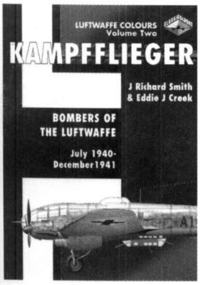

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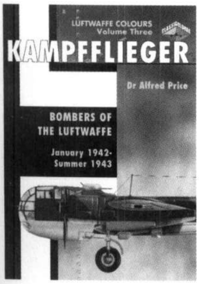

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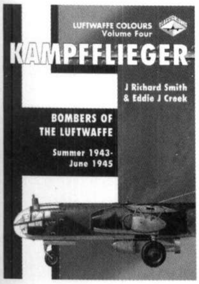

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